

Chapter 9 – Patterns of Inheritance

- The science of heredity is referred to as
 - karyotyping
 - genetics
 - inheritance
 - a breeding program
- Which of the following statements best represents the theory of pangenesis developed by Hippocrates?
 - Pregnancy is a spontaneous event, and the characteristics of the offspring are determined by the gods.
 - Particles called pangenes originating in each part of an organism's body collect in the sperm and eggs and are passed on to the next generation.
 - Offspring inherit the traits of either the mother or the father but not both.
 - Fertilization of plants is dependent on an animal.
 - Both a and c.
- Biologists of the early nineteenth century believed which of the following?
 - Offspring inherit the traits of either their mother or their father but not both.
 - Inheritance is a spontaneous event occurring strictly by random.
 - Hereditary materials contributed by the male and female parents blend to form the offspring.
 - Traits developed over the lifetime of the parents will be passed to their offspring.
 - None of the above.
- Which of the following researchers discovered fundamental principles of genetics by breeding garden peas?
 - Watson and Crick
 - Mendel
 - Krebs
 - Jenner
 - Hippocrates
- Varieties of plants in which self-fertilization produces offspring that are identical to the parents are referred to as:
 - hybrids
 - the F₂ generation
 - monohybrid crosses
 - independent crosses
 - true-breeding
- A monohybrid cross is:
 - the second generation of a self-fertilized plant.
 - a breeding experiment in which the parental varieties have only one trait in common.
 - a breeding experiment in which the parental varieties differ in only one trait
 - a triploid plant that results from breeding two very different plants
 - none of the above
- When a gene for a given trait comes in alternative versions that specify different forms of the trait (for example, purple-flower and white-flower versions of a flower-color gene), the versions of the gene are called:
 - loci
 - supergenes
 - chromosomes
 - alleles
 - gametes
- An organism with two different alleles for a single trait is said to be
 - homozygous
 - heterozygous
 - genotypically similar
 - segregated
 - cross-fertilized
- The expressed or physical traits of an organism are referred to as its
 - phenotype
 - genotype
 - expressed form
 - genetic heritage
 - none of the above

10. The genetic makeup of an organism constitutes its
a. phenotype b. genotype c. autosomal heritage d. karyotype e. archetype
11. Research since Mendel's time has established that the principle of the segregation of genes during gamete formation.
a. applies to all forms of life
b. applies to all sexually reproducing organisms
c. applies to all asexually reproducing organisms
d. applies only to unicellular organisms
e. was invalid
12. An allele that is fully expressed is referred to as
a. dominant b. recessive c. homologous d. heterozygous e. none of the above
13. An allele that has no noticeable effect on the appearance of an organism unless it is found in a homozygous condition is said to be
a. dominant b. recessive c. codominant d. heterozygous e. none of the above
14. Alleles of a gene are found at _____ chromosomes.
a. the same locus on homologous mitochondrial
b. the same locus on heterologous
c. different loci on homologous
d. different loci on heterologous
e. the same locus on homologous
15. Mendel's principle of independent assortment states that
a. chromosomes sort independently of each other during mitosis and meiosis
b. genes sort independently of each other in animals but not in plants
c. independent sorting of genes produces polyploidy plants under some circumstances
d. each pair of alleles segregates independently during gamete formation
e. both a and d
16. What is a testcross?
a. a mating between an individual of unknown genotype and an individual homozygous recessive for the trait of interest
b. a mating between an individual
c. a mating between an individual of unknown genotype and an individual homozygous dominant for the trait of interest
d. a mating between two individuals heterozygous for the trait of interest
e. either a or c
17. Using a six-sided die, what is the probability of rolling either a 5 or a 6?
a. $1/6 \times 1/6 = 1/36$ b. $1/6 + 1/6 = 1/3$ c. $1/6 \times 1/6 = 1/3$ d. $1/6 + 1/6 = 1/12$ e. $1/6$
18. Assuming that the probability of having a female child is 50% and the probability of having a male child is also 50%, what is the probability that a couples first-born child is female and second-born child is male?
a. 25% b. 50% c. 75% d. 100% e. more information is needed to answer the question.

19. A carrier of a genetic disorder who does not show symptoms is most likely to be _____ to transmit it to offspring.
- heterozygous for the trait and able
 - hemizygous for the trait and unable
 - heterologous for the trait and able
 - homozygous for the trait and able
 - homozygous for the trait and unable
20. Dr. Smith's parents have normal hearing. However, Dr. Smith has an inherited form of deafness. Deafness is a recessive trait that is associated with the abnormal allele *d*. The normal allele at this locus, associated with normal hearing, is *D*. Dr. Smith's parents could have which of the following genotypes?
- DD* and *dd*
 - dd* and *dd*
 - Dd* and *Dd*
 - DD* and *DD*
 - either c or d
21. Most genetic disorders of humans are caused by
- dominant alleles
 - recessive alleles
 - drinking during pregnancy
 - a mutation that occurs in the egg, sperm, or zygote that gives rise to the affected individual
22. Which of the following reasons accounts for the fact that dominant alleles that cause lethal disorders are less common than recessive alleles that cause lethal disorders?
- Lethal disorders caused by dominant alleles are usually more severe than lethal disorders caused by recessive alleles.
 - Unlike lethal disorders caused by recessive alleles, lethal disorders caused by dominant alleles usually cause death of the embryo
 - Most individuals carrying a lethal dominant allele have the disorder and die before they reproduce, whereas individuals carrying a lethal recessive allele are more likely to be healthy and reproduce.
 - the presence of a lethal dominant allele cause sterility
 - Many lethal recessive alleles cause enhanced disease resistance when they are present in the heterozygous state, and carriers of these alleles have more children, on average, than other people.
23. Both amniocentesis and chorionic villus sampling allow for _____ and _____ of the fetus so that it can be tested for abnormalities.
- imaging; biochemical testing
 - imaging; karyotyping
 - sexing; imaging
 - karyotyping; biochemical testing
 - direct observation; biochemical testing
24. Which of the following is an example of incomplete dominance in humans?
- sickle-cell disease
 - hypercholesterolemia
 - phenylketonuria
 - some forms of cancer
25. Imagine that beak color in a finch species is controlled by a single gene. You mate a finch homozygous for orange (pigmented) beak with a finch homozygous for ivory (unpigmented) beak and get numerous offspring all of which have a pale, ivory-orange beak. This pattern of color expression is most likely to be an example of;
- incomplete dominance
 - codominance
 - pleiotropy
 - polygenic inheritance
 - crossing over
26. The impact of a single gene on more than one trait is called;
- incomplete dominance
 - codominance
 - pleiotropy
 - polygenic inheritance
 - blending

35. A plant species in which individual plants produce both sperm and eggs is called
a. dioecious b. hermaphroditic c. monoecious d. polyploid e. pleiotropic
36. An animal species in which an individual produces both eggs and sperm is called
a. dioecious b. hermaphroditic c. monoecious d. polyploidy e. pleiotropic
37. How is sex determined in most ants and bees?
a. by the X-Y system b. by the Z-W system c. by the number of chromosome sets
d. by the size of the sex chromosome e. by the X-O system
38. What is meant by the statement that “male bees are fatherless”?
a. Male bees don't play a role in rearing of bee young.
b. Male bees are produced by budding
c. Male bees develop from fertilized eggs
d. Male bees develop from unfertilized eggs
e. The queen bee's mate dies before the male eggs hatch.
39. Recessive sex-linked human conditions include which of the following?
a. red-green color blindness b. muscular dystrophy c. hemophilia
d. albinism e. a, b, and c
40. Why are sex-linked conditions more common in men than in women?
a. Men acquire two copies of the defective gene during fertilization.
b. Men need inherit only one copy of the recessive allele for the condition to be fully expressed
c. Women must inherit two copies of the recessive gene for the condition to be fully expressed
d. The sex chromosomes are more active in men than in women
e. both b and c