Test Bank

by J. Michael Bailey
to accompany
Human Sexuality, Fourth Edition
LeVay • Baldwin

Chapter 2: Sex and Evolution

Multiple Choice

1. The rate of evolutionary change in a species would be likely to slow down if
a. all members of the species were similar.
b. offspring were not very similar to parents.
c. differences among the members of the species caused large differences in their numbers of offspring.
d. Both a and b
e. All of the above
Answer: d
Textbook Reference: Diverse Methods of Reproduction Have Evolved, pp. 29–30
Bloom's Category: 4. Analyzing

2. Traits that are passed down from parents to offspring are termed
a. heritable.
b. conjugations.
c. eukaryotes.
d. gametes.
e. parthenogenic.
Answer: a
Textbook Reference: Diverse Methods of Reproduction Have Evolved, pp. 29–30
Bloom's Category: 1. Remembering

3. Scientists estimate the number of genes in the human genome to be between _____ and _____.
a. 44; 46
b. 500; 5000
c. 20,000; 25,000
d. 1 million; 2 million
e. 50 million; 100 million
Answer: c
Textbook Reference: Diverse Methods of Reproduction Have Evolved, pp. 29–30
Bloom's Category: 1. Remembering

4. Sexual reproduction differs from asexual reproduction in that sexual reproduction
a. occurs by mitosis.

b. requires the mixing of genes from two individuals.
c. is similar to artificial cloning.
d. is nonadaptive.
e. does not place participants at risk.
Answer: b
Textbook Reference: Diverse Methods of Reproduction Have Evolved, pp. 29–31
Bloom's Category: 2. Understanding

5. The final product of mitosis is
a. haploid gametes.
b. haploid daughter cells.
c. diploid gametes.
d. diploid daughter cells.
e. haploid polymorphisms.
Answer: d
Textbook Reference: Diverse Methods of Reproduction Have Evolved, pp. 30–31
Bloom's Category: 2. Understanding

6. A form of reproduction is asexual rather than sexual if
a. organisms do not have sexual intercourse.
b. organisms carry genes of only one parent.
c. reproduction promotes DNA replication.
d. it is performed by eukaryotic organisms.
e. it involves meiosis.
Answer: b
Textbook Reference: Diverse Methods of Reproduction Have Evolved, pp. 30–31
Bloom's Category: 3. Applying

7. Which of the following occurs *only* during sexual reproduction?
a. Mitosis
b. Meiosis
c. Budding
d. Cell division
e. Both a and c
Answer: b
Textbook Reference: Diverse Methods of Reproduction Have Evolved, pp. 30–31
Bloom's Category: 4. Analyzing

8. The sequence of cell divisions known as _____ occurs within the reproductive tissues.
a. mitosis
b. meiosis
c. conjugation
d. parthenogenesis
e. adaptation
Answer: b

Textbook Reference: Diverse Methods of Reproduction Have Evolved, p. 31
Bloom's Category: 1. Remembering

9. Two species are closely related, except that one of them (Species A) reproduces sexually and the other (Species B) reproduces asexually. As time goes on, which of the following should happen?
a. Species A should grow more rapidly than Species B.
b. Species B should grow more rapidly than Species A.
c. Species A should have more harmful mutations than Species B.
d. Species B should have more harmful mutations than Species A.
e. Both b and d
Answer: e
Textbook Reference: Rival Theories Offer Explanations for Sexual Reproduction, pp. 31–33
Bloom's Category: 5. Evaluating

10. One of the advantages of sexual reproduction over asexual reproduction is that it
a. contributes to the development of new defenses against disease.
b. leads to gene combinations that prove to be functionless.
c. is less adaptable to changing environments.
d. involves the passing of 100% of the genetic material from parents to offspring.
e. involves reduced risk to parents.
Answer: a
Textbook Reference: Rival Theories Offer Explanations for Sexual Reproduction, pp. 31–33
Bloom's Category: 2. Understanding

11. Which of the following statements about reproduction is true?
a. Males generally invest more than females.
b. Males choose among females for mates.
c. Females generally invest more than males.
d. Females are generally more competitive than males.
e. In choosing their mates, females disregard physical characteristics of males and focus only on behavior.
Answer: c
Textbook Reference: Rival Theories Offer Explanations for Sexual Reproduction, pp. 31–33
Bloom's Category: 2. Understanding

12. The key feature of sexual reproduction is that
a. it is less adaptive than asexual reproduction.
b. it occurs when females outnumber males.
c. it occurs when males outnumber females.
d. it increases the occurrence of mutations in a species.
e. offspring carry a mixture of genes from both parents.
Answer: e

Textbook Reference: Rival Theories Offer Explanations for Sexual Reproduction, pp. 31–33
Bloom's Category: 2. Understanding

13. The theory that gene mixing is an adaptation that protects a host from constantly evolving parasites is called the
a. Red Queen hypothesis.
b. parthenogenic hypothesis.
c. theory of natural selection.
d. polymorphism theory.
e. theory of beneficial mutations.
Answer: a
Textbook Reference: Rival Theories Offer Explanations for Sexual Reproduction, pp. 31–33
Bloom's Category: 2. Understanding

14. _____ help organisms perpetuate their genes in future generations.
a. Competitors
b. Adaptations
c. Polymorphisms
d. Mutations
e. Conjugations
Answer: b
Textbook Reference: Rival Theories Offer Explanations for Sexual Reproduction, pp. 31–33
Bloom's Category: 1. Remembering

15. The mixing of _____ in sexual reproduction may be useful in helping offspring adapt to environmental change.
a. genes
b. hormones
c. gonads
d. eukaryotes
e. MHC markers
Answer: a
Textbook Reference: Rival Theories Offer Explanations for Sexual Reproduction, pp. 31–35
Bloom's Category: 2. Understanding

16. The most general evolutionary advantage of sexual reproduction is that it
a. ensures that organisms must experience pleasure in order to reproduce
b. ensures that at least some offspring have better genes than their parents.
c. ensures that all offspring have better genes than their parents.
d. is the most rapid rate of reproduction.
e. is the least costly form of reproduction.
Answer: b

Textbook Reference: Rival Theories Offer Explanations for Sexual Reproduction, pp. 31–35
Bloom's Category: 5. Evaluating

17. Sexually reproducing species are _____ successful at resisting parasites than asexually reproducing species because they _____.
a. more; have fewer harmful mutations
b. less; have more harmful mutations
c. more; are more likely to have beneficial combinations of genes
d. less; are less likely to have beneficial combinations of genes
e. Both a and c
Answer: c
Textbook Reference: Rival Theories Offer Explanations for Sexual Reproduction, pp. 34–35
Bloom's Category: 3. Applying

18. Which of the following is the main evolutionary reason that many species have two sexes?
a. Two sexes allow for the elimination of harmful mutations.
b. Two sexes are necessary for sexual reproduction.
c. Two sexes reduce the harmfulness of parasites.
d. Larger gametes cost more to produce than smaller ones but are more likely to succeed.
e. Both a and c
Answer: d
Textbook Reference: Why Are There Two Sexes? pp. 35–37
Bloom's Category: 4. Analyzing

19. Females usually exceed males in all of the following areas *except* for
a. commitment of resources.
b. speed of gametes.
c. investment in reproduction.
d. size of gametes.
e. certainty of reproducing.
Answer: b
Textbook Reference: Why Are There Two Sexes? pp. 35–37
Bloom's Category: 3. Applying

20. According to disruptive selection, individuals that are *not* favored are those that produce
a. small gametes.
b. large gametes.
c. middle-sized gametes.
d. too many gametes.
e. haploid gametes.
Answer: c
Textbook Reference: Why Are There Two Sexes? pp. 35–37

Bloom's Category: 3. Applying

21. The purpose of sexual behavior among members of parthenogenic whiptail lizard species is to
a. promote egg development and ovulation.
b. exchange gametes.
c. mix genetic material.
d. promote mate guarding behavior.
e. promote sperm development and ejaculation.
Answer: a
Textbook Reference: Why Are There Two Sexes? pp. 35–37
Bloom's Category: 2. Understanding

22. The division of one population into two groups, male and female, is an example of
a. natural selection.
b. binary fission.
c. disruptive selection.
d. conjugation.
e. having sex.
Answer: c
Textbook Reference: Why Are There Two Sexes? pp. 35–37
Bloom's Category: 2. Understanding

23. Prior to fertilization, a mature female gamete is called a(n)
a. zygote.
b. isogamete.
c. chromatid.
d. daughter cell.
e. ovum.
Answer: e
Textbook Reference: Why Are There Two Sexes? p. 37
Bloom's Category: 1. Remembering

24. Hermaphrodites do *not* generally fertilize themselves because
a. they are not adapted to do so.
b. sexual reproduction is more advantageous genetically.
c. they only reproduce asexually.
d. they usually fail to survive to adulthood.
e. they only reproduce with other species.
Answer: b
Textbook Reference: Why Are There Two Sexes? pp. 37–38
Bloom's Category: 2. Understanding

25. Which of the following statements about hermaphroditic organisms is *false*?
a. They have both male and female reproductive functions.
b. They exist among plants.

c. They exist among animals.
d. They usually fertilize themselves.
e. They reproduce sexually.
Answer: d
Textbook Reference: Why Are There Two Sexes? pp. 37–38
Bloom's Category: 4. Analzying

26. In most animal species the ratio of males to females is
a. nearly equal.
b. about 2:1 in favor of males.
c. about 2:1 in favor of females.
d. heavily weighted toward males because they are aggressive and dominant.
e. heavily weighted toward females because they are nurturing.
Answer: a
Textbook Reference: Why Are There Two Sexes? p. 38
Bloom's Category: 2. Understanding

27. A species of marine mollusks called nudibranchs are hermaphrodites that produce both sperm and ova and
a. fertilize themselves.
b. must find another individual to mate with.
c. do not reproduce.
d. are sterile.
e. reproduce via conjugation.
Answer: b
Textbook Reference: Why Are There Two Sexes? p. 38
Bloom's Category: 2. Understanding

28. There are no known species in which individual organisms have more than _____ parents.
a. 2
b. 3
c. 4
d. 5
e. 6
Answer: a
Textbook Reference: Why Are There Two Sexes? p. 38
Bloom's Category: 1. Remembering

29. Which of the following is the most important factor explaining why, in most species, there are similar numbers of males and females?
a. Species with similar numbers of males and females grow the most quickly.
b. The existence of fewer females would lead to much more male violence.
c. A gene that made more of one sex would eventually be outcompeted by genes that increased the rate of the other sex.
d. Offspring need fathers and mothers equally.

e. Species with uneven sex ratios have more difficulty shedding harmful mutations.
Answer: c
Textbook Reference: Why Are There Two Sexes? pp. 38–39
Bloom's Category: 4. Analyzing

30. At every stage in development, _____ are more likely than _____ to die.
a. eukaryotic organisms; single-celled organisms
b. girls; boys
c. sexual species; asexual species
d. boys; girls
e. multi-celled organisms; single-celled organisms
Answer: d
Textbook Reference: Why Are There Two Sexes? p. 39
Bloom's Category: 1. Remembering

31. In mammals, an individual with _____ will be male and one with _____ will be female.
a. a Y chromosome; an X chromosomes
b. a Y chromosome; two X chromosomes
c. a Y chromosome; no Y chromosome
d. no X chromosome; an X chromosome
e. no X chromosome; two X chromosomes
Answer: c
Textbook Reference: Evolution Has Led to Diverse Methods of Sex Determination, pp. 39–40
Bloom's Category: 2. Understanding

32. In mammals, when an ovum and sperm fuse at fertilization, a female offspring results if the ovum receives
a. a Y chromosome from the sperm.
b. an X chromosome from the sperm.
c. both an X and Y chromosome from the sperm.
d. two X chromosomes from the sperm.
e. two Y chromosomes from the sperm.
Answer: b
Textbook Reference: Evolution Has Led to Diverse Methods of Sex Determination, pp. 39–40
Bloom's Category: 2. Understanding

33. Humans possess 46 chromosomes, _____ of which are called autosomes.
a. 2
b. 22
c. 23
d. 44
e. 46
Answer: d

Textbook Reference: Evolution Has Led to Diverse Methods of Sex Determination, pp. 39–41
Bloom's Category: 2. Understanding

34. Men and women possess similar
a. sex chromosomes.
b. zygotes.
c. autosomes.
d. gonads
e. *SRY* genes.
Answer: c
Textbook Reference: Evolution Has Led to Diverse Methods of Sex Determination, pp. 39–41
Bloom's Category: 2. Understanding

35. The universal mechanism of sex determination in animals is
a. the Y chromosome.
b. the X chromosome.
c. *SRY*.
d. All of the above
e. None of the above
Answer: e
Textbook Reference: Evolution Has Led to Diverse Methods of Sex Determination, pp. 39–41
Bloom's Category: 1. Remembering

36. Another term for a fertilized ovum is a
a. hermaphrodite.
b. zygote.
c. polymorphism.
d. eukaryote.
e. polygyny.
Answer: b
Textbook Reference: Evolution Has Led to Diverse Methods of Sex Determination, p. 40
Bloom's Category 1. Remembering

37. An individual with a chromosomal complement of 47 (XYY) is categorized as
a. asexual.
b. parthenogenic.
c. female.
d. *SRY*-neutral.
e. male.
Answer: e
Textbook Reference: Evolution Has Led to Diverse Methods of Sex Determination, p. 40
Bloom's Category: 2. Understanding

38. An individual with a chromosomal complement of 47 (XXY) is categorized as
a. asexual.
b. parthenogenic.
c. female.
d. *SRY*-neutral.
e. male.
Answer: e
Textbook Reference: Evolution Has Led to Diverse Methods of Sex Determination, p. 40
Bloom's Category: 2. Understanding

39. Males typically exhibit a reproductive strategy that is
a. nurturing.
b. invested.
c. exploitative.
d. asymmetrical.
e. temperature-dependent.
Answer: c
Textbook Reference: Sexual Selection Produces Anatomical and Behavioral Differences between Males and Females, p. 41
Bloom's Category: 2. Understanding

40. Which of the following statements about typical sex differences in reproduction and mating is *false*?
a. Males are more likely than females to fail to reproduce.
b. The minimum investment that a female must make in reproduction is larger than that of a male.
c. Males can have more offspring than females can.
d. Males compete for females more than females compete for males.
e. Males are more concerned than females with getting a high quality mate.
Answer: e
Textbook Reference: Sexual Selection Produces Anatomical and Behavioral Differences between Males and Females, pp. 41–42
Bloom's Category: 4. Analyzing

41. Which of the following is the most important limit on a male's reproductive success?
a. The number of sperm he can produce
b. The amount of investment he must make in each offspring
c. The number of females with whom he can reproduce
d. The energy he has for sex
e. His resistance to sexually transmitted parasites
Answer: c
Textbook Reference: Sexual Selection Produces Anatomical and Behavioral Differences between Males and Females, pp. 41–42
Bloom's Category: 5. Evaluating

42. Which of the following is the most important limit on a female's reproductive success?
a. The number of males with whom she can reproduce
b. The energy she has for sex
c. Her resistance to sexually transmitted parasites
d. The amount of investment she must make in each offspring
e. The number of eggs she can produce
Answer: d
Textbook Reference: Sexual Selection Produces Anatomical and Behavioral Differences between Males and Females, pp. 41–42
Bloom's Category: 5. Evaluating

43. A high degree of fluctuating asymmetry is associated with
a. intact chromosomal function.
b. immunity from infection.
c. tolerance to toxins.
d. tolerance to stress.
e. decreased reproductive success.
Answer: e
Textbook Reference: Sexual Selection Produces Anatomical and Behavioral Differences between Males and Females, pp. 41–42
Bloom's Category: 2. Understanding

44. Compared to male animals, female animals invest much more heavily in their offspring. Which of the following is *not* one of the areas in which the female investment is greater than that of the male?
a. Carrying children internally during gestation
b. Feeding children after birth
c. Protecting children from predators
d. Fighting off rivals for their mate's attention
e. Being fertilized internally
Answer: d
Textbook Reference: Sexual Selection Produces Anatomical and Behavioral Differences between Males and Females, pp. 41–42
Bloom's Category: 4. Analyzing

45. In which of the following organisms does fertilization occur within a male's body?
a. Elephant
b. Horse
c. Sea horse
d. Mule
e. Hyena
Answer: c
Textbook Reference: Sexual Selection Produces Anatomical and Behavioral Differences between Males and Females, pp. 41–42
Bloom's Category: 1. Remembering

46. Among birds, the sex that invests less in parenting of offspring tends to be
a. smaller and less colorful than its partner.
b. larger and more brightly colored than its partner.
c. female.
d. the more attentive partner.
e. a poor mate.
Answer: b
Textbook Reference: Sexual Selection Produces Anatomical and Behavioral Differences between Males and Females, pp. 41–47
Bloom's Category: 2. Understanding

47. Greater variance in reproductive success experienced by males leads to
a. conjugation.
b. nurturing behavior.
c. invested sexual strategies.
d. asexual reproduction.
e. risky sexual strategies.
Answer: e
Textbook Reference: Sexual Selection Produces Anatomical and Behavioral Differences between Males and Females, pp. 41–47
Bloom's Category: 2. Understanding

48. A trait favored by male–male competition is
a. nurturing behavior.
b. asexual reproduction.
c. sexual endurance.
d. small body size.
e. lack of bright coloration.
Answer: c
Textbook Reference: Sexual Selection Produces Anatomical and Behavioral Differences between Males and Females, p. 42
Bloom's Category: 2. Understanding

49. In species in which males are larger than females, the size difference is usually due to
a. competition between males for mates.
b. competition between males and females.
c. the need for females to provide nutrients to their offspring.
d. the need for males to demonstrate high quality to females.
e. the evolution in males of traits that help them protect their offspring.
Answer: a
Textbook Reference: Sexual Selection Produces Anatomical and Behavioral Differences between Males and Females, p. 42
Bloom's Category: 2. Understanding

50. The fact that attractive physical characteristics have a cost makes them

a. attractive to mates.
b. painful.
c. environmental.
d. maladaptive.
e. undesirable to mates.
Answer: a
Textbook Reference: Sexual Selection Produces Anatomical and Behavioral Differences between Males and Females, p. 44
Bloom's Category: 2. Understanding

51. In a certain bird species, females are attracted to males with long, bright green tail feathers. If a scientist were to glue feathers onto a male bird's tail to make it twice the length of a naturally found tail, which of the following would likely result?
a. Female birds would in all cases be especially attracted to the male with the artificially lengthened tail.
b. Female birds would be especially attracted to the male with the artificially lengthened tail if the tail were symmetric.
c. Female birds would be less attracted to the male with the artificially lengthened tail because the tail would be perceived as unnatural.
d. Female birds would pay attention only to the degree of symmetry of the male's artificially lengthened tail, not to its length.
e. The male with the artificially-lengthened tail would survive longer than other males.
Answer: b
Textbook Reference: Sexual Selection Produces Anatomical and Behavioral Differences between Males and Females, p. 44
Bloom's Category: 5. Evaluating

52. When rodents are *not* in estrus they
a. hop and dart around.
b. wiggle their ears.
c. copulate with males.
d. are able to be impregnated.
e. reject male courtship.
Answer: e
Textbook Reference: Sexual Selection Produces Anatomical and Behavioral Differences between Males and Females, p. 45
Bloom's Category: 2. Understanding

53. _____ behaviors elicit reciprocal courtship.
a. Monogamous
b. Receptive
c. Promiscuous
d. Mate guarding
e. Proceptive
Answer: e

Textbook Reference: Sexual Selection Produces Anatomical and Behavioral Differences between Males and Females, p. 45
Bloom's Category: 2. Understanding

54. Which of the following is most likely to be true in species in which males invest in reproduction about as much as females do?
a. Males and females are similar in appearance.
b. Females compete for males more than males compete for females.
c. Males carry the offspring inside their bodies.
d. Females are the brighter, larger sex.
e. Neither sex competes for the other.
Answer: a
Textbook Reference: Sexual Selection Produces Anatomical and Behavioral Differences between Males and Females, pp. 46–47
Bloom's Category: 3. Applying

55. Male promiscuity is more common than female promiscuity because, typically,
a. females have no reason to prefer one male over another.
b. females do not have to invest much in competition for mates.
c. males invest less in reproduction.
d. females are not interested in males unless the males will invest in offspring.
e. All of the above
Answer: c
Textbook Reference: Sexual Selection Produces Anatomical and Behavioral Differences between Males and Females, pp. 48–49
Bloom's Category: 2. Understanding

56. Which of the following is the *least* likely reason that a monogamously-mated female would engage in sex with a male other than her partner?
a. To obtain extra food
b. Because the extra-pair partner has better genes than her partner
c. Because the extra-pair partner is more dominant than her partner
d. To suggest to the extra-pair partner that he might be the father of her future offspring
e. To have more offspring than she would with just one partner
Answer: e
Textbook Reference: Diverse Relationship Styles Have Evolved, pp. 48–49
Bloom's Category: 3. Applying

57. In a species that practices polyandry, we would expect to find that
a. males invest an unusually large amount in reproduction.
b. females compete for males.
c. males are much larger than females.
d. Both a and b
e. All of the above
Answer: d
Textbook Reference: Diverse Relationship Styles Have Evolved, pp. 48–49

Bloom's Category: 3. Applying

58. Which of the following is famous for forming lifelong pair bonds?
a. Rabbits
b. Swans
c. Ducks
d. Bears
e. Lizards
Answer: b
Textbook Reference: Diverse Relationship Styles Have Evolved, pp. 48–49
Bloom's Category: 1. Remembering

59. A social relationship called _____ consists of a single female with a harem of males.
a. monogamy
b. polyamory
c. polygyny
d. polyandry
e. promiscuity
Answer: d
Textbook Reference: Diverse Relationship Styles Have Evolved, pp. 48–49
Bloom's Category: 1. Remembering

60. Individuals that mate only within their pair-bond are called
a. polygynous.
b. polyandrous.
c. promiscuous.
d. sexually monogamous.
e. socially monogamous.
Answer: d
Textbook Reference: Diverse Relationship Styles Have Evolved, pp. 48–49
Bloom's Category: 2. Understanding

61. A social relationship called _____ consists of a single male with a harem of females
a. monogamy
b. polyamory
c. polygyny
d. polyandry
e. promiscuity
Answer: c
Textbook Reference: Diverse Relationship Styles Have Evolved, pp. 48–49
Bloom's Category: 1. Remembering

62. Sexual monogamy may be imposed on males when females
a. refuse to engage in extra-pair mating.

b. leave the relationship.
c. are incapable of reproduction.
d. become promiscuous.
e. exhibit mate guarding behavior.
Answer: a
Textbook Reference: Diverse Relationship Styles Have Evolved, p. 49
Bloom's Category: 2. Understanding

63. The willingness of animals, including humans, to engage in sex outside of an established relationship is termed
a. pornography.
b. prostitution.
c. adultery.
d. polygamy.
e. promiscuity.
Answer: e
Textbook Reference: Diverse Relationship Styles Have Evolved, p. 49
Bloom's Category: 1. Remembering

64. Which of the following would be most likely if females of a species mated promiscuously?
a. Males would ejaculate large amounts of sperm.
b. Males would be much larger than females.
c. Females would compete for access to males.
d. Both a and b
e. All of the above
Answer: a
Textbook Reference: Diverse Relationship Styles Have Evolved, p. 50
Bloom's Category: 2. Understanding

65. When a male remains close to a female throughout her fertile period and keeps other males away from her, he is
a. mate guarding.
b. acting foolishly.
c. condoning female promiscuity.
d. sterile.
e. past his sexual prime.
Answer: a
Textbook Reference: Diverse Relationship Styles Have Evolved, p. 50
Bloom's Category: 1. Remembering

66. Haploid gametes
a. are necessary for asexual reproduction.
b. contain twice the number of chromosomes of a diploid cell.
c. are produced by the process of mitosis.
d. are devoid of chromosomes.

e. contain half the number of chromosomes of a diploid cell.
Answer: e
Textbook Reference: Diverse Relationship Styles Have Evolved, p. 50
Bloom's Category: 1. Remembering

67. Males may respond to female promiscuity by
a. producing brightly colored fur or feathers.
b. producing large numbers of sperm.
c. ignoring their mates.
d. gathering a harem of mates.
e. producing small numbers of sperm.
Answer: b
Textbook Reference: Diverse Relationship Styles Have Evolved, p. 51
Bloom's Category: 2. Understanding

68. Which of the following is the main evolutionary reason that individuals in some species tend to help their relatives?
a. The relatives have similar traits as the individuals that help them.
b. There is little cost to helping relatives.
c. Relatives tend to reciprocate the help.
d. The relatives are especially likely to share genes with the individuals that help them.
e. The behavior is learned early by offspring as they observe their mothers.
Answer: d
Textbook Reference: Sometimes, Helping Relatives Reproduce Is a Good Strategy, p. 52
Bloom's Category: 3. Applying

69. Kin selection favors _____ behavior in primates.
a. maternal
b. paternal
c. aunting
d. sibling rivalry
e. incestuous
Answer: c
Textbook Reference: Sometimes, Helping Relatives Reproduce Is a Good Strategy, pp. 52–53
Bloom's Category: 2. Understanding

70. The kin selection theory has been applied most successfully to
a. social insects, such as bees and ants.
b. siblings that display extreme jealousy.
c. step-relationships in humans.
d. incestuous family members.
e. opposite-sex sibling sexual relations.
Answer: a
Textbook Reference: Sometimes, Helping Relatives Reproduce Is a Good Strategy, pp. 52–53

Bloom's Category: 2. Understanding

71. Which of the following brother and sister pairs could most plausibly have an incestuous sexual relationship?
a. A biologically related brother and sister who were reared together until the age of 10, separated, and then were reunited at age 30
b. A biologically related brother and sister who were reared in a culture that does not teach that incest is sinful
c. A brother and sister who are step-siblings (not biologically related), lived together from infancy until age 10, separated, and then were reunited at age 30
d. A biologically related brother and sister who did not meet each other until age 15
e. Both a and c
Answer: d
Textbook Reference: Sex Has Acquired Other Functions beyond Reproduction, p. 54
Bloom's Category: 4. Analyzing

72. Which of the following correlates most strongly with moral opposition to sibling incest?
a. Opposition to adoption
b. Time spent living with a same-sex sibling
c. Opposition to communal living
d. Time spent living with an opposite-sex sibling
e. Religious upbringing
Answer: d
Textbook Reference: Sex Has Acquired Other Functions beyond Reproduction, p. 54
Bloom's Category: 2. Understanding

73. Bonobos are similar to humans in terms of the frequency with which they
a. have sex when they cannot conceive.
b. have sex with other members of their group in order to resolve conflict.
c. have homosexual sex.
d. Both a and b
e. All of the above
Answer: a
Textbook Reference: Sex Has Acquired Other Functions beyond Reproduction, pp. 55–56
Bloom's Category: 2. Understanding

74. There is evidence that female mice avoid sex with males carrying
a. haploid cells.
b. different MHC markers.
c. eukaryotic cells.
d. diploid cells.
e. similar MHC markers.
Answer: e

Textbook Reference: Sex Has Acquired Other Functions beyond Reproduction, pp. 55–56
Bloom's Category: 2. Understanding

Multiple Choice (from Companion Website)
(by Claire Vanston)

1. In order for the process of natural selection to occur within a species, the traits of individuals must be _____ and _____.
a. invariant; heritable
b. invariant; adaptive
c. somewhat variable; heritable
d. somewhat heritable; adaptive
e. somewhat variant; nonheritable
Answer: c
Textbook Reference: Diverse Methods of Reproduction Have Evolved, pp. 29–30
Bloom's Category: 3. Applying

2. Most cells of the body are _____ and _____; however, the gametes of a mammal are _____.
a. prokaryotic; diploid; haploid
b. eukaryotic; diploid; haploid
c. eukaryotic; haploid; diploid
d. asexual; meiotic; mitotic
e. protolitic; mitotic; diploid
Answer: b
Textbook Reference: Diverse Methods of Reproduction Have Evolved, pp. 30–33
Bloom's Category: 3. Applying

3. Parthenogenesis occurs
a. during gestation.
b. in proceptive females.
c. as a form of asexual reproduction.
d. All of the above
e. None of the above
Answer: c
Textbook Reference: Rival Theories Offer Explanations for Sexual Reproduction, pp. 31–33
Bloom's Category: 2. Understanding

4. The benefits of sexual reproduction outweigh its costs because
a. the mixing of genes offers substantial advantages in dealing with changing environmental challenges.
b. sexual reproduction permits the removal of harmful mutations in the genome.
c. harmful mutations must occur at a low rate.

d. Both a and b
e. All of the above are benefits.
Answer: d
Textbook Reference: Rival Theories Offer Explanations for Sexual Reproduction, pp. 33–35
Bloom's Category: 2. Understanding

5. The Red Queen hypothesis states that
a. sexual reproduction affords a strategy for hosts to outwit parasites.
b. asexual reproduction is adaptive in challenging environments.
c. males will be larger and compete for access to fertile females.
d. offspring of asexual reproduction are genetically dissimilar.
e. females will prefer asymmetrical males.
Answer: a
Textbook Reference: Rival Theories Offer Explanations for Sexual Reproduction, pp. 34–35
Bloom's Category: 2. Understanding

6. Female gametes are _____, while male gametes are _____.
a. small and nutrient-rich; large and motile
b. large and motile; small and nutrient-rich
c. nutrient-poor and motile; large and motile
d. large and diploid; small and motile
e. large and nutrient-rich; small and motile
Answer: e
Textbook Reference: Why Are There Two Sexes? pp. 35–36
Bloom's Category: 2. Understanding

7. Whiptail lizards of the species *C. uniparens* are _____, exhibit _____ sexual behavior, and use _____ reproduction.
a. both male and female; no; parthenogenetic
b. both male and female; both male and female; sexual
c. sexless; no; sexual
d. all female; both male and female; parthenogenetic
e. male; male; asexual
Answer: d
Textbook Reference: Why Are There Two Sexes? p. 36
Bloom's Category: 3. Applying

8. The process whereby evolutionary processes cause one population to give rise to two is called _____ selection.
a. bifurcating
b. sexual
c. disruptive
d. divergent
e. natural

Answer: c
Textbook Reference: Why Are There Two Sexes? p. 37
Bloom's Category: 1. Remembering

9. Species that are classified as hermaphrodites
a. produce both kinds of gametes and usually fertilize themselves.
b. produce male and female gametes and usually reproduce sexually.
c. usually reproduce by a simple process of binary fusion.
d. Both a and c apply to hermaphrodites.
e. None of the above applies to hermaphrodites.
Answer: b
Textbook Reference: Why Are There Two Sexes? pp. 37–38
Bloom's Category: 2. Understanding

10. A person with the *SRY* gene plus an _____ sex chromosome combination will result in a female.
a. XX
b. XXY
c. XXX
d. XYY
e. None of the above
Answer: e
Textbook Reference: Evolution Has Led to Diverse Methods of Sex Determination, p. 40
Bloom's Category: 3. Applying

11. Which of the following is the correct order of mammalian maternal investment?
a. Gestation, delivery, lactation
b. Delivery, lactation, gestation
c. Delivery, gestation, lactation
d. Lactation, delivery, gestation
e. Oviposition, gestation, lactation
Answer: a
Textbook Reference: Sexual Selection Produces Anatomical and Behavioral Differences between Males and Females, pp. 41, 46
Bloom's Category: 4. Analyzing

12. For species in which females invest more resources in offspring than males,
a. males will choose the most attractive female.
b. males will tend to be large and aggressive.
c. females will be motivated to choose the best available male.
d. Both b and c
e. All of the above
Answer: d
Textbook Reference: Sexual Selection Produces Anatomical and Behavioral Differences between Males and Females, pp. 41–47
Bloom's Category: 3. Applying

13. Which of the following behaviors is *not* an example of male courtship behavior?
a. Nest construction in some birds
b. Provision of food items in some spiders
c. Ear-wiggling in rats
d. Singing in birds
e. All of the above are examples of male courtship behavior.
Answer: c
Textbook Reference: Sexual Selection Produces Anatomical and Behavioral Differences between Males and Females, pp. 41–47
Bloom's Category: 2. Understanding

14. Disadvantageous processes, such as chromosomal defects, exposure to environmental toxins, infections or parasites can increase the _____ of males, which is _____ to females.
a. fluctuating asymmetry; unattractive
b. bilateral symmetry; attractive
c. fluctuating symmetry; unattractive
d. fluctuating asymmetry; attractive
e. stable asymmetry; attractive
Answer: a
Textbook Reference: Sexual Selection Produces Anatomical and Behavioral Differences between Males and Females, pp. 43–44
Bloom's Category: 4. Analyzing

15. _____ behaviors are exhibited by a female rat during _____ in order to elicit courtship behavior from males.
a. Receptive; copulation
b. Receptive; estrus
c. Proceptive; copulation
d. Receptive; ovulation
e. Proceptive; estrus
Answer: e
Textbook Reference: Sexual Selection Produces Anatomical and Behavioral Differences between Males and Females, p. 45
Bloom's Category: 2. Understanding

16. The only animals in which fertilization is known to take place within the body of the male are
a. sea horses.
b. sticklebacks.
c. jacanas
d. hyenas.
e. phalaropes.
Answer: a

Textbook Reference: Sexual Selection Produces Anatomical and Behavioral Differences between Males and Females, p. 46
Bloom's Category: 1. Remembering

17. The genital swelling of baboons is directly related to
a. dominance.
b. ovulation.
c. aggression.
d. parenting.
e. the size of their genitals.
Answer: b
Textbook Reference: Sexual Selection Produces Anatomical and Behavioral Differences between Males and Females, p. 47
Bloom's Category: 1. Remembering

18. The jacana is a _____ that uses a _____ mating system.
a. rodent; polyandrous
b. bird; polyandrous
c. coral reef fish; monogamous
d. phalarope; polygynous
e. bird; polygynous
Answer: b
Textbook Reference: Diverse Relationship Styles Have Evolved, p. 47
Bloom's Category: 2. Understanding

19. The pressures of _____ favor the evolution of large testes and large sperm quantities, an extreme example of which is the _____.
a. polygyny; gorilla
b. polygyny; boar
c. sperm competition; gorilla
d. sperm competition; boar
e. polyandry; human male
Answer: d
Textbook Reference: Diverse Relationship Styles Have Evolved, pp. 50–51
Bloom's Category: 2. Understanding

20. The _____ scorpionfly has evolved a special appendage called the _____ organ to assist in forced copulation.
a. female; ovipositor
b. female; notal
c. male; notal
d. male; ovipositor
e. male and female; clasper
Answer: c
Textbook Reference: Diverse Relationship Styles Have Evolved, pp. 51–52
Bloom's Category: 2. Understanding

21. As quantified through kin selection theory, _____ offspring of an individual animal's cousin is "worth" about one of the individual's own offspring.
a. 2
b. 6
c. 18
d. 8
e. 4
Answer: d
Textbook Reference: Sometimes, Helping Relatives Reproduce Is a Good Strategy, p. 52
Bloom's Category: 3. Applying

22. Identical twins share 100% of their genes. According to kin selection theory, one such twin might be willing to give up one offspring's worth of resources if doing so would help the other twin to have _____ or more extra offspring (i.e., in addition to what would have been born anyway).
a. 1
b. 2
c. 4
d. 8
e. None of the above
Answer: a
Textbook Reference: Sometimes, Helping Relatives Reproduce Is a Good Strategy, pp. 52–53
Bloom's Category: 3. Applying

23. Female mice prefer to mate with males whose _____ are _____to her own.
a. MHC markers; dissimilar
b. *SRY* genes; dissimilar
c. MHC markers; similar
d. imprinted genes; dissimilar
e. imprinted genes; similar
Answer: a
Textbook Reference: Sometimes, Helping Relatives Reproduce Is a Good Strategy, pp. 53–54
Bloom's Category: 2. Understanding

24. A strong moral opposition to sibling incest is particularly common among people who spent their childhood
a. with a same-sex sibling.
b. as a single child.
c. as an adoptee.
d. in a large family.
e. with an opposite-sex sibling.
Answer: e
Textbook Reference: Sometimes, Helping Relatives Reproduce Is a Good Strategy, p. 54

Bloom's Category: 2. Understanding

25. Female bonobos are sexually receptive during
a. lactation.
b. menstruation.
c. ovulation.
d. Both a and c
e. All of the above
Answer: d
Textbook Reference: Sex Has Acquired Other Functions beyond Reproduction, pp. 55–56
Bloom's Category: 2. Understanding

Fill in the Blank

1. The principles of evolution were presented by _____ in *The Origin of Species* (1859).
Answer: Charles Darwin
Textbook Reference: Diverse Methods of Reproduction Have Evolved, p. 29
Bloom's Category: 1. Remembering

2. The main factor in evolution is _____, as evidenced by the estimate that life appeared on Earth about 3.7 billion years ago.
Answer: time
Textbook Reference: Diverse Methods of Reproduction Have Evolved, p. 30
Bloom's Category: 2. Understanding

3. Heritable traits are encoded by _____, of which an individual has thousands.
Answer: genes
Textbook Reference: Diverse Methods of Reproduction Have Evolved, p. 30
Bloom's Category: 1. Remembering

4. Genes are linear stretches of _____.
Answer: DNA
Textbook Reference: Diverse Methods of Reproduction Have Evolved, p. 30
Bloom's Category: 1. Remembering

5. The process whereby a disadvantageous trait is passed on to fewer offspring and tends to die out is termed _____.
Answer: natural selection
Textbook Reference: Diverse Methods of Reproduction Have Evolved, p. 30
Bloom's Category: 1. Remembering

6. The mixing of genes in sexual reproduction occurs through the fusion of two specialized cells known as _____.

Answer: gametes
Textbook Reference: Diverse Methods of Reproduction Have Evolved, p. 31
Bloom's Category: 1. Remembering

7. _____ are random changes in heritable traits that may occur in sexual reproduction.
Answer: Mutations
Textbook Reference: Rival Theories Offer Explanations for Sexual Reproduction, p. 33
Bloom Category: 1. Remembering

8. An individual in which male and female reproductive functions are combined within one body is called a _____.
Answer: hermaphrodite
Textbook Reference: Why Are There Two Sexes? p. 37
Bloom's Category: 1. Remembering

9. Men and women have _____ pairs of autosomes plus two sex chromosomes.
Answer: 22
Textbook Reference: Evolution Has Led to Diverse Methods of Sex Determination, p. 39
Bloom's Category: 1. Remembering

10. The production of gametes in which the number of chromosomes is halved is called _____.
Answer: meiosis
Textbook Reference: Evolution Has Led to Diverse Methods of Sex Determination, p. 40
Bloom's Category: 2. Understanding

11. The fusing of an ovum and sperm at fertilization results in the formation of a _____.
Answer: zygote
Textbook Reference: Evolution Has Led to Diverse Methods of Sex Determination, p. 40
Bloom's Category: 1. Remembering

12. In humans, a zygote receives the _____ chromosome from the ovum and the _____ chromosome from the sperm.
Answer: X; X or Y
Textbook Reference: Evolution Has Led to Diverse Methods of Sex Determination, p. 40
Bloom's Category: 1. Remembering

13 For the Y chromosome to determine the formation of a male zygote, it must carry the _____ gene.
Answer: *SRY*
Textbook Reference: Evolution Has Led to Diverse Methods of Sex Determination, p. 40
Bloom's Category: 2. Understanding

14. In many species of reptiles, sex is determined by the _____ at which eggs are incubated.

Answer: temperature
Textbook Reference: Evolution Has Led to Diverse Methods of Sex Determination, p. 40
Bloom's Category: 1. Remembering

15. The evolutionary process by which male peacocks strut and rustle their gorgeous tail feathers, while plain peahens watch silently and decide which male to mate with, is called _____.
Answer: sexual selection
Textbook Reference: Sexual Selection Produces Anatomical and Behavioral Differences between Males and Females, p. 41
Bloom's Category: 1. Remembering

16. In order to gauge a male's genetic quality, females of different species often pay attention to an aspect of a male's physical appearance called _____.
Answer: fluctuating asymmetry
Textbook Reference: Sexual Selection Produces Anatomical and Behavioral Differences between Males and Females, p. 43
Bloom's Category: 2. Understanding

17. Attractive odors emitted by sexually receptive females are called _____.
Answer: pheromones
Textbook Reference: Sexual Selection Produces Anatomical and Behavioral Differences between Males and Females, p. 43
Bloom's Category: 1. Remembering

18. When copulation can result in fertilization, hormonal changes cause female animals to undergo _____, or heat.
Answer: estrus
Textbook Reference: Sexual Selection Produces Anatomical and Behavioral Differences between Males and Females, p. 45
Bloom's Category: 1. Remembering

19. Evidence of paternity can be supplied by _____ testing of a mother and her offspring.
Answer: DNA
Textbook Reference: Diverse Relationship Styles Have Evolved, p. 49
Bloom's Category: 1. Remembering

20. When the dominant male in a polygynous species is displaced by a new male, the new male may _____ the offspring born to the harem females.
Answer: kill
Textbook Reference: Diverse Relationship Styles Have Evolved, p. 50
Bloom's Category: 2. Understanding

Essay (from Companion Website)

(by Claire Vanston)

1. A few species seem to have adopted completely asexual reproductive strategies—describe these strategies and discuss some of the issues that they raise for theories of reproduction.
Textbook Reference: Diverse Methods of Reproduction Have Evolved, pp. 30–31; Rival Theories Offer Explanations for Sexual Reproduction, pp. 31–33

2. Diagram the cellular basis of reproduction for both mitosis and meiosis. Provide examples of species that only reproduce asexually; that only reproduce sexually; and that reproduce both sexually and asexually.
Textbook Reference: Rival Theories Offer Explanations for Sexual Reproduction, pp. 31–35

3. Map out the processes through which it is believed that most species came to have two sexes. Be sure to use the following terms in your answer: investment, gametes, nurture, exploit, and disruptive.
Textbook Reference: Why Are There Two Sexes? pp. 35–39

4. Using examples, describe the mechanisms by which the sex of a developing animal may be determined. In the case of mammals, also briefly mention what we know to be the key genetic component in this process.
Textbook Reference: Evolution Has Led to Diverse Methods of Sex Determination, pp. 39–41

5. Explain how the different reproductive strategies of male and female mammals have resulted in choosy females and competitive males.
Textbook Reference: Sexual Selection Produces Anatomical and Behavioral Differences between Males and Females, pp. 41–43

6. Discuss female selection of mates based on physical appearance and behavior. Using several case studies, describe the outward appearance of the physical or behavioral trait, the information that is being conveyed to the female, and the costs and benefits to the male.
Textbook Reference: Sexual Selection Produces Anatomical and Behavioral Differences between Males and Females, pp. 43–47

7. Under what circumstances do males make substantial investments in reproduction? Describe how this is reflected in the appearance and behavior of different species.
Textbook Reference: Sexual Selection Produces Anatomical and Behavioral Differences between Males and Females, pp. 45–47

8. Identify the major categories of social mating arrangements. Compare and contrast the prevalence of male and female promiscuity across these categories, including relevant examples. What is the payoff for promiscuity for males and for females?
Textbook Reference: Diverse Relationship Styles Have Evolved, pp. 48–52

9. Discuss how being a “helping relative” can be adaptive. Under what conditions might this type of behavior occur and between what degree of relatives? Use social insects as an example to illustrate your answer.
Textbook Reference: Sometimes, Helping Relatives Reproduce Is a Good Strategy, pp. 52–53

10. Why do most cultures ban marriage between closely related family members? Describe how this social phenomenon might be related to an evolved adaptation.
Textbook Reference: Sometimes, Helping Relatives Reproduce Is a Good Strategy, pp. 53–54

11. What functions other than reproduction might sex serve? Discuss this as it relates to the sexual behavior of bonobos.
Textbook Reference: Sex Has Acquired Other Functions beyond Reproduction, pp. 53–56

Learning Objectives (from Companion Website)
(by Claire Vanston)

1. Provide an overview of the process of evolution by natural selection, noting specifically the emergence and reproductive characteristics of eukaryotic cells.
Textbook Reference: Diverse Methods of Reproduction Have Evolved, pp. 29–31

2. Summarize the major steps involved in both mitosis and meiosis.
Textbook Reference: Diverse Methods of Reproduction Have Evolved, pp. 29–31

3. Outline the various explanations that have been proposed to account for the evolution of sexual reproduction and its commonality across species.
Textbook Reference: Rival Theories Offer Explanations for Sexual Reproduction, pp. 31–35

4. Discuss the major evolutionary issues in the development and maintenance of two sexes in most species. What theoretical issues are raised by the existence of sexless species, and what processes regulate sex ratios in other species?
Textbook Reference: Why Are There Two Sexes? pp. 35–39

5. Describe mammalian sex determination and compare it to sex determination in many reptilian species.
Textbook Reference: Evolution Has Led to Diverse Methods of Sex Determination, pp. 39–41

6. Explain the mechanics of sexual selection—the pressures that are exerted and the effects that they have on the anatomy, appearance, and behavior of animals. Illustrate your main points with examples from various species.

Textbook Reference: Sexual Selection Produces Anatomical and Behavioral Differences between Males and Females, pp. 41–47

7. Discuss the distinction between social arrangements and sexual reality in animal liaisons, and how there may be a mismatch between the two. In particular, analyze and contrast the costs and benefits of promiscuity for males and females.
Textbook Reference: Diverse Relationship Styles Have Evolved, pp. 48–52

8. Explain kin selection theory and the concept of inclusive fitness, and then show how these concepts explain much, but not all, altruistic behavior.
Textbook Reference: Sometimes, Helping Relatives Reproduce Is a Good Strategy, pp. 52–53

9. With special reference to bonobos, discuss the evolution and possible functions of nonreproductive sex.
Textbook Reference: Sex Has Acquired Other Functions beyond Reproduction, pp. 53–56

Class Discussion Questions (from Instructor's Manual)

1. Discuss dating and mate selection on your campus. Does the general assumption that males compete for mates and females are choosy about their mates apply?

2. What criteria do young adult females establish in choosing a male for dating? In choosing a male as a lifetime partner? If these criteria differ, why do you think this is so? Provide both (and distinguish) psychological reasons—how men and women feel differently about sex, dating, and mating—and ultimate, evolutionary reasons—how men and women evolved to be different.

3. In what ways, if any, does willingness to engage in casual sex differ between males and females on your college campus?

4. Discuss the similarities and differences between sexual behavior in humans and in some specific non-human animals. (Remember, not all animals are alike, so be specific!)

5. There have been a number of reproductively-important novel developments during the recent past. For example, contraception has made the link between sex and reproduction a weaker one. Social services protect children, even unwanted children, much more than was true during most of human evolution. Consider some of these changes, and speculate how they will affect human evolution in the long term. Your speculation should focus on changes in the ways people will behave in the future due to changes in genes, resulting from the novel developments.

Discussion Questions (from Media Guide)

(by Michael Jason McCoy)

1. What contributions does an evolutionary perspective offer the science of sex research?

2. Define sexual selection.

3. What are the benefits of sexual reproduction as compared to asexual reproduction?

4. Why do you think jealousy has evolved?

5. Compare monogamy and polygamy with respect to their strengths and weaknesses as reproductive strategies.

6. Identify three examples of courtship behavior that appears exaggerated and/or counter-productive for individual survival.

7. What evolutionary purpose might homosexuality serve?

8. Compare and contrast the concept of gender using a socially-constructed definition and a biologically-based definition.

Discussion Questions (from the textbook)

1. Do you think that the sexual behavior of nonhuman animals, as discussed in this chapter, is likely or unlikely to be relevant to an understanding of human sexuality? Why?

2. If the technique of reproductive cloning were perfected and universally adopted by humans, would that affect future human evolution? How would it affect people's moral views about sexual behavior?

Key Terms (from the textbook)

adaptive
asexual reproduction
autosome
chromosome
clitoris
conjugation
copulation
courtship behavior
diploid
DNA (deoxyribonucleic acid)
estrus

eukaryote
evolution
fluctuating asymmetry
gamete
gene
genome
gestation
gonad
haploid
heritable
hermaphrodite
inclusive fitness
internal fertilization
investment
kin selection
lactation
mate guarding
meiosis
mitosis
monogamy
mutation
natural selection
ovum (pl. ova)
pair bond
parthenogenesis
paternity test
pheromone
polyandry
polygamy
polygyny
polymorphism
proceptive behavior
promiscuity
Red Queen hypothesis
scrotum
semen
sex chromosome
sex determination
sexual monogamy
sexual reproduction
sexual selection
social monogamy
sperm
SRY (*S*ex-determining *R*egion of the *Y* chromosome)
vulva
X chromosome

Y chromosomes
zygote