

TOTAL

ASSESSMENT GUIDE

Chapter 2

Heredity and the Environment

Topic (A-head)		Factual	Conceptual	Applied
Genes and Human Reproduction	Multiple Choice	1–7, 9, 11–28, 30–37, 41–44, 48, 50, 51, 55	8, 29, 38, 39, 52–54, 56	40, 45–47, 57
	True/False	2–6, 8, 9	1	7, 10
	Short Answer	1–3, 5–7	4	
	Essay	3	1, 2, 4	
How Traits and Genetic Abnormalities Are Inherited	Multiple Choice	10, 58, 59, 61, 62, 65, 67, 68, 70, 75–86, 89, 91–98	60, 66, 71, 74	63, 64, 69, 72, 73, 87, 88, 90
	True/False	11–16		
	Short Answer	8		
	Essay	5, 7		6
How Genes and Environments Interact	Multiple Choice	100, 102–105, 114, 120, 124, 125, 127	101, 107–111, 113, 115–117, 119, 123	99, 106, 112, 118, 121, 122, 126
	True/False		17, 18	
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Behavior Genetics: Measuring the Heritability of Traits	Multiple Choice	49, 128, 132, 134, 135, 138, 139, 144–149, 151, 152	129–131, 133, 140, 141, 143, 150	136, 137, 142
	True/False	12	19, 20	
	Short Answer			
	Essay			

CHAPTER 2 HEREDITY AND THE ENVIRONMENT

2.1 Multiple-Choice Questions

2.1-1. A karyotype is

- A) an image of a person's brain while they sleep.
- B) the set of cellular processes that include meiosis and mitosis.
- C) a picture that includes all of an individual's chromosomes.
- D) the entire set of genes that encompass the human species.

Difficulty: 2

Question ID: 2.1-1

Page Ref: 39

Topic: Genes and Human Reproduction

Skill: Factual

Answer: C) a picture that includes all of an individual's chromosomes

2.1-2. Strands of deoxyribonucleic acid molecules that contain the genetic codes are called

- A) chromosomes.
- B) DNA.
- C) RNA.
- D) genes.

Difficulty: 1

Question ID: 2.1-2

Page Ref: 39

Topic: Genes and Human Reproduction

Skill: Factual

Answer: A) chromosomes

2.1-3. Chromosomes are strands of _____ molecules.

- A) DNA
- B) RNA
- C) guanine
- D) cytosine

Difficulty: 1

Question ID: 2.1-3

Page Ref: 39

Topic: Genes and Human Reproduction

Skill: Factual

Answer: A) DNA

2.1-4. Two strands of molecules that twist around each other like a spiral staircase are called

- A) a chromosome.
- B) DNA.
- C) a gene.
- D) a genome.

Difficulty: 1

Question ID: 2.1-4

Page Ref: 39–40

Topic: Genes and Human Reproduction

Skill: Factual

Answer: B) DNA.

2.1-5. The “stairs” of DNA molecules are made of

- A) nucleotide bases.
- B) adenine, thymine, guanine, and cytosine.

- C) both A and B.
- D) neither A nor B.

Difficulty: 2

Question ID: 2.1-5

Page Ref: 40

Topic: Genes and Human Reproduction

Skill: Factual

Answer: C) both A and B

2.1-6. The statement “adenine always pairs with thymine and guanine always pairs with cytosine” refers to the pairing of

- A) genes in the single pair of sex chromosomes.
- B) nucleotide bases in a DNA molecule.
- C) lipid bases in a DNA molecule.
- D) phosphate bases in a DNA cell.

Difficulty: 2

Question ID: 2.1-6

Page Ref: 40

Topic: Genes and Human Reproduction

Skill: Factual

Answer: B) nucleotide bases in a DNA molecule

2.1-7. Which of the following is NOT one of the nucleotide base molecules that form DNA?

- A) xanthine
- B) thymine
- C) guanine
- D) cytosine

Difficulty: 2

Question ID: 2.1-7

Page Ref: 40

Topic: Genes and Human Reproduction

Skill: Factual

Answer: A) xanthine

2.1-1. If a strand of nucleotide base pairs follows the sequence of C, T, G, G, A, you know that its complementary sequence on the other strand will be

- A) G, T, C, C, G.
- B) T, A, G, G, C.
- C) T, C, C, A, G.
- D) G, A, C, C, T.

Difficulty: 3

Question ID: 2.1-8

Page Ref: 40

Topic: Genes and Human Reproduction

Skill: Conceptual

Answer: D) G, A, C, C, T. *Cytosine pairs with guanine, and thymine pairs with adenine.*

2.1-9. Research has uncovered that about half of the parents surveyed who had utilized an artificial insemination technique said that they

- A) planned to tell their children the truth about how they were conceived.
- B) would definitely not disclose information about their child’s conception.
- C) would use artificial conception techniques again.
- D) worried about their children hearing the truth from someone else.

Difficulty: 3

Question ID: 2.1-9

Page Ref: 43

Topic: Genes and Human Reproduction

Skill: Factual

Answer: A) planned to tell their children the truth about how they were conceived.

2.1-10. When technicians remove the chromosomes from fetal cells that are collected during an amniocentesis, they arrange them by size to form a picture called

A) a karyotype.

B) a genotype.

C) a phenotype.

D) a linotype.

Difficulty: 2

Question ID: 2.1-10

Page Ref: 56–57

Topic: How Traits and Genetic Abnormalities Are Inherited

Skill: Factual

Answer: A) a karyotype

2.1-11. _____ is a segment of DNA that provides an instruction for a particular structure, function, or trait.

A) A chromosome

B) A genome

C) A gene

D) A cytosine molecule

Difficulty: 1

Question ID: 2.1-11

Page Ref: 40

Topic: Genes and Human Reproduction

Skill: Factual

Answer: C) A gene

2.1-12. Within the 46 chromosomes in each human cell, there are approximately _____ pairs of nucleotide bases.

A) 1 million

B) 10 million

C) 500 million

D) 3 billion

Difficulty: 3

Question ID: 2.1-12

Page Ref: 40

Topic: Genes and Human Reproduction

Skill: Factual

Answer: D) 3 billion

2.1-13. There are approximately _____ genes aligned along the set of 46 chromosomes in each human cell.

A) 20,000 to 30,000

B) 200 to 300

C) 20 to 30

D) 2 million to 3 million

Difficulty: 3

Question ID: 2.1-13

Page Ref: 40

Topic: Genes and Human Reproduction

Skill: Factual

Answer: A) 20,000 to 30,000

2.1-14. Less than _____ of the base pairs in human DNA provide active instructions.

- A) 2%
- B) 10%
- C) 20%
- D) 70%

Difficulty: 3

Question ID: 2.1-14

Page Ref: 40

Topic: Genes and Human Reproduction

Skill: Factual

Answer: A) 2%

2.1-15. A type of gene that operates in pairs across matched chromosomes is called

- A) a chromosome.
- B) a genome.
- C) an adenine.
- D) an allele.

Difficulty: 1

Question ID: 2.1-15

Page Ref: 43

Topic: Genes and Human Reproduction

Skill: Factual

Answer: D) an allele

2.1-16. An allele is an _____ of a gene.

- A) inactive portion
- B) incomplete piece or segment
- C) alternative version or instance
- D) artificially produced duplicate

Difficulty: 1

Question ID: 2.1-16

Page Ref: 43

Topic: Genes and Human Reproduction

Skill: Factual

Answer: C) alternative version or instance

2.1-17. During _____, the sperm and egg cells join, and chromosomes from the father and mother combine.

- A) mitosis
- B) fertilization
- C) amniocentesis
- D) probabilistic epigenesis

Difficulty: 1

Question ID: 2.1-17

Page Ref: 43

Topic: Genes and Human Reproduction

Skill: Factual

Answer: B) fertilization

2.1-18. Research on alternative techniques for conception

- A) indicates an increased risk for autism.
- B) does not indicate any particular developmental problems.
- C) has revealed a delay in language development.
- D) suggests higher rates of Down syndrome.

Difficulty: 2

Question ID: 2.1-18

Page Ref: 48

Topic: Genes and Human Reproduction

Skill: Factual

Answer: B) does not indicate any particular developmental problems

2.1-19. There is some research to suggest that parents of children born via _____ can be somewhat overinvolved in their children's emotional lives.

- A) artificial insemination
- B) embryo donation
- C) cryopreservation
- D) in vitro fertilization

Difficulty: 3

Question ID: 2.1-19

Page Ref: 48-49

Topic: Genes and Human Reproduction

Skill: Factual

Answer: B) embryo donation

2.1-20. All of the following are examples of alternative techniques for conception EXCEPT

- A) in vitro fertilization.
- B) cryopreservation.
- C) nucleotide mapping.
- D) surrogacy.

Difficulty: 1

Question ID: 2.1-20

Page Ref: 48

Topic: Genes and Human Reproduction

Skill: Factual

Answer: C) nucleotide mapping

2.1-21. When sperm are collected from the father and then injected into the mother's reproductive system, this is called

- A) artificial insemination.
- B) in vitro fertilization.
- C) assisted in vivo fertilization.
- D) cryopreservation.

Difficulty: 1

Question ID: 2.1-21

Page Ref: 48

Topic: Genes and Human Reproduction

Skill: Factual

Answer: A) artificial insemination

2.1-22. _____ occurs when embryos, that had originally developed in a petri dish, are placed in the mother's uterus for further development.

- A) Artificial insemination
- B) In vitro fertilization
- C) Assisted in vivo fertilization
- D) Cryopreservation

Difficulty: 1

Question ID: 2.1-22

Page Ref: 48

Topic: Genes and Human Reproduction

Skill: Factual

Answer: B) In vitro fertilization

2.1-23. _____ occurs when collected eggs and sperm are injected into the fallopian tube of the mother for fertilization and further development.

- A) Artificial insemination
- B) In vitro fertilization
- C) Assisted in vivo fertilization
- D) Cryopreservation

Difficulty: 1

Question ID: 2.1-23

Page Ref: 48

Topic: Genes and Human Reproduction

Skill: Factual

Answer: C) Assisted in vivo fertilization

2.1-24. The term used to refer to a fertilized egg cell that has begun to divide is

- A) an allele.
- B) a zygote.
- C) a genome.
- D) a sex chromosome.

Difficulty: 1

Question ID: 2.1-24

Page Ref: 43

Topic: Genes and Human Reproduction

Skill: Factual

Answer: B) a zygote

2.1-25. After fertilization occurs, cell division takes place according to the process of

- A) probabilistic epigenesis.
- B) canalization.
- C) meiosis.
- D) mitosis.

Difficulty: 2

Question ID: 2.1-25

Page Ref: 43

Topic: Genes and Human Reproduction

Skill: Factual

Answer: D) mitosis

2.1-26. Which of the following is the term for cell division that is also known as “copy division”?

- A) myelination
- B) meiosis
- C) mitosis
- D) fertilization

Difficulty: 1

Question ID: 2.1-26

Page Ref: 43

Topic: Genes and Human Reproduction

Skill: Factual

Answer: C) mitosis

2.1-27. Which of the following is the first step of mitosis?

- A) Duplicated pairs of chromosomes line up along the center of the cell.
- B) The DNA unwraps from the chromosome.
- C) The DNA material on each chromosome “unzips.”
- D) The 46 chromosomes duplicate themselves.

Difficulty: 2

Question ID: 2.1-27

Page Ref: 43

Topic: Genes and Human Reproduction

Skill: Factual

Answer: C) The DNA material on each chromosome “unzips.”

2.1-28. Which of the following is the term for cell division that is also known as “reduction division”?

- A) myelination
- B) meiosis
- C) mitosis
- D) fertilization

Difficulty: 1

Question ID: 2.1-28

Page Ref: 44-45

Topic: Genes and Human Reproduction

Skill: Factual

Answer: B) meiosis

2.1-29. _____ ensures that a child receives 23 chromosomes from each parent.

- A) Meiosis
- B) Crossing over
- C) Mitosis
- D) Nonshared environment

Difficulty: 2

Question ID: 2.1-29

Page Ref: 44-45

Topic: Genes and Human Reproduction

Skill: Conceptual

Answer: A) Meiosis. *Meiosis (“reduction division”) results in sex cells that have 23 chromosomes so that during fertilization both parents contribute equally to the offspring’s genotype.*

2.1-30. A gamete is

- A) a product of mitosis and is essential for healthy cell division.
- B) a sex cell containing half the number of chromosomes as a regular cell.
- C) a cluster of DNA strands along a specific sex chromosome.
- D) a type of sex cell that becomes sperm upon entering the fallopian tube.

Difficulty: 2

Question ID: 2.1-30

Page Ref: 44

Topic: Genes and Human Reproduction

Skill: Factual

Answer: B) a sex cell containing half the number of chromosomes as a regular cell

2.1-31. Sperm and egg cells are formed during

- A) fertilization.
- B) reproduction.
- C) meiosis.
- D) mitosis.

Difficulty: 1

Question ID: 2.1-31

Page Ref: 44-45

Topic: Genes and Human Reproduction

Skill: Factual

Answer: C) meiosis

2.1-32. The process of fertilization creates one cell with

- A) 23 chromosomes.
- B) 46 chromosomes.
- C) 92 chromosomes.

D) It depends on whether or not identical twins will be formed.

Difficulty: 2

Question ID: 2.1-32

Page Ref: 44-45

Topic: Genes and Human Reproduction

Skill: Factual

Answer: B) 46 chromosomes

2.1-33. The process of crossing-over

A) increases the potential for healthy sperm to reach the site of fertilization.

B) ensures variability among the genetic codes of siblings.

C) ensures that characteristics will be transmitted from parents to offspring.

D) decreases the likelihood of mutations, chromosomal abnormalities, and birth defects.

Difficulty: 1

Question ID: 2.1-33

Page Ref: 45

Topic: Genes and Human Reproduction

Skill: Factual

Answer: B) ensures variability among the genetic codes of siblings

2.1-34. The 23rd pair of chromosomes

A) is the last pair.

B) determines whether the offspring will be male or female.

C) is called the sex chromosomes.

D) all of the above

Difficulty: 1

Question ID: 2.1-34

Page Ref: 44-45

Topic: Genes and Human Reproduction

Skill: Factual

Answer: D) all of the above

2.1-35. An individual whose 23rd pair of chromosomes is XY

A) is a genetic male.

B) has Down syndrome.

C) has Turner syndrome.

D) has Klinefelter syndrome.

Difficulty: 1

Question ID: 2.1-35

Page Ref: 45

Topic: Genes and Human Reproduction

Skill: Factual

Answer: A) is a genetic male

2.1-36. An individual's sex is determined by

A) the whole genome.

B) the 23rd pair of chromosomes.

C) the amount of adenine in the father's sperm.

D) the number of nucleotide bases.

Difficulty: 2

Question ID: 2.1-36

Page Ref: 45

Topic: Genes and Human Reproduction

Skill: Factual

Answer: B) the 23rd pair of chromosomes

2.1-37. Females can only pass _____ to their eggs.

- A) the Y chromosome
- B) the X chromosome
- C) two X chromosomes
- D) no sex chromosomes

Difficulty: 1

Question ID: 2.1-37

Page Ref: 45

Topic: Genes and Human Reproduction

Skill: Factual

Answer: B) the X chromosome

2.1-38. The sex of the offspring depends on

- A) whether the child has 23 or 46 chromosomes on their genome.
- B) whether the fertilization results in mitosis or meiosis.
- C) whether the mother contributes an X or Y chromosome.
- D) whether the father contributes an X or Y chromosome.

Difficulty: 2

Question ID: 2.1-38

Page Ref: 45

Topic: Genes and Human Reproduction

Skill: Conceptual

Answer: D) whether the father contributes an X or Y chromosome. *The father's sex chromosome (either X or Y) determines the sex of the offspring. The mother has no influence, as she always contributes an X chromosome.*

2.1-39. Which of the following is NOT a disorder discussed in your text as being linked to a certain gene location?

- A) fragile X mental retardation
- B) hemophilia
- C) Huntington's disease
- D) fetal alcohol syndrome

Difficulty: 2

Question ID: 2.1-39

Page Ref: 41

Topic: Genes and Human Reproduction

Skill: Conceptual

Answer: D) fetal alcohol syndrome. *FAS is caused by maternal alcohol consumption during pregnancy.*

2.1-40. Alicia and Kenny are fraternal twins. Patty and Penelope are sisters born four years apart. Which of these two pairs of siblings is most similar genetically?

- A) Alicia and Kenny, the fraternal twins, are most similar genetically.
- B) Patty and Penelope, the sisters, are most similar genetically.
- C) The fraternal twins and the sisters are equal in genetic similarity.
- D) The degree of similarity cannot be determined without DNA testing.

Difficulty: 2

Question ID: 2.1-40

Page Ref: 46

Topic: Genes and Human Reproduction

Skill: Applied

Answer: C) The fraternal twins and the sisters are equal in genetic similarity. *Fraternal, or nonidentical, twins are conceived from separate eggs and separate sperm in the same way nontwin siblings are conceived. In both cases, the siblings share, on average, 50% of their genes.*

2.1-41. _____ are the type of twins formed when one zygote divided to make two zygotes.

- A) Monozygotic twins
- B) Dizygotic twins
- C) both A and B

D) neither A nor B

Difficulty: 1

Question ID: 2.1-41

Page Ref: 46

Topic: Genes and Human Reproduction

Skill: Factual

Answer: A) Monozygotic twins

2.1-42. Which of the following factors influences the rates of MZ twinning?

A) ethnicity

B) a history of MZ twins on the mother's side of the family

C) maternal age

D) The rate of MZ twins is virtually the same in all segments of the population.

Difficulty: 1

Question ID: 2.1-42

Page Ref: 46

Topic: Genes and Human Reproduction

Skill: Factual

Answer: D) The rate of MZ twins is virtually the same in all segments of the population.

2.1-43. _____ are the type of twins formed when two eggs are fertilized by two different sperm cells.

A) Monozygotic twins

B) Dizygotic twins

C) both A and B

D) neither A nor B

Difficulty: 1

Question ID: 2.1-43

Page Ref: 46

Topic: Genes and Human Reproduction

Skill: Factual

Answer: B) Dizygotic twins

2.1-44. Which of the following statements regarding dizygotic twins is not TRUE?

A) DZ twins can be different sexes.

B) DZ twins must have different fathers.

C) DZ twins are identical in appearance.

D) none of the above

Difficulty: 2

Question ID: 2.1-44

Page Ref: 46-47

Topic: Genes and Human Reproduction

Skill: Factual

Answer: C) DZ twins are identical in appearance.

2.1-45. Half-identical twins are also known as

A) fraternal twins.

B) polar body twins.

C) identical twins.

D) nonidentical.

Difficulty: 3

Question ID: 2.1-45

Page Ref: 46

Topic: Genes and Human Reproduction

Skill: Applied

Answer: B) polar body twins

- 2.1-46. Half-identical twins are formed from
- A) a single egg that divides before being fertilized.
 - B) an egg dividing into two immediately after fertilization.
 - C) two different eggs fertilized by two different sperm.
 - D) Half-identical twins are a myth.

Difficulty: 2

Question ID: 2.1-46

Page Ref: 46

Topic: Genes and Human Reproduction

Skill: Applied

Answer: A) a single egg that divides before being fertilized

- 2.1-47. Your new friend, Alex, wants you to meet his twin sister, Alexis. You immediately recognize that Alex is probably a(n)
- A) fraternal twin.
 - B) monozygotic twin.
 - C) identical twin.
 - D) MZ twin.

Difficulty: 1

Question ID: 2.1-47

Page Ref: 46

Topic: Genes and Human Reproduction

Skill: Applied

Answer: A) fraternal twin. *If twins are different sexes, they must have developed from different fertilized eggs. They are therefore nonidentical twins.*

- 2.1-48. Which of the following factors influences the rates of DZ twinning?
- A) ethnicity
 - B) a history of DZ twins on the mother's side of the family
 - C) maternal age
 - D) all of the above

Difficulty: 2

Question ID: 2.1-48

Page Ref: 46-48

Topic: Genes and Human Reproduction

Skill: Factual

Answer: D) all of the above

- 2.1-49. The most extensively studied behavioral trait is
- A) intelligence.
 - B) spatial reasoning.
 - C) anxiety.
 - D) sexual orientation.

Difficulty: 1

Question ID: 2.1-49

Page Ref: 68

Topic: Behavior Genetics: Measuring the Heritability of Traits

Skill: Factual

Answer: A) intelligence

- 2.1-50. The purpose of the _____ is to map the order of every nucleotide base and locate the position of every gene in the human genome.

- A) Multinational Genetics Cooperative
- B) Worldwide DNA Analysis
- C) Human Genome Project
- D) Gene Mapping Program

Difficulty: 1

Question ID: 2.1-50

Page Ref: 40

Topic: Genes and Human Reproduction

Skill: Factual

Answer: C) Human Genome Project

2.1-51. One of the long-term goals of the Human Genome Project is to find

- A) markers for every disease that can be inherited.
- B) the genes that determine personality.
- C) how life began on Earth millions of years ago.
- D) a safe method for cloning humans.

Difficulty: 1

Question ID: 2.1-51

Page Ref: 40

Topic: Genes and Human Reproduction

Skill: Factual

Answer: A) markers for every disease that can be inherited

2.1-52. Certain reproductive technologies have made it possible to do which of the following?

- A) determine the sexual orientation of fetuses
- B) allow parents to select the sex of their children
- C) select the healthiest embryos to carry to birth
- D) select embryos for optimal height and weight

Difficulty: 2

Question ID: 2.1-52

Page Ref: 41

Topic: Genes and Human Reproduction

Skill: Conceptual

Answer: B) allow parents to select the sex of their children. *Embryos that are developed in vitro can be tested to determine if their sex chromosomes are XX or XY.*

2.1-53. How might the Human Genome Project help in the detection and treatment of specific diseases?

- A) It may provide a genetic test to determine if you are predisposed to the disease.
- B) It may suggest preventative steps to be taken to avoid developing the disease.
- C) It may provide a gene therapy, in which “good” genes replace “diseased” genes.
- D) all of the above

Difficulty: 2

Question ID: 2.1-53

Page Ref: 40

Topic: Genes and Human Reproduction

Skill: Conceptual

Answer: D) all of the above. *By cataloging all human genes, researchers hope to create genetic tests, preventative treatments, and gene therapies for diseases.*

2.1-54. Which of the following is a moral question that has arisen due to the work of the Human Genome Project?

- A) Should certain individuals choose to become parents?
- B) Should we selectively abort embryos with tendencies toward specific diseases?
- C) Should we selectively abort embryos that will not be intellectually gifted?
- D) Should we selectively abort embryos to help slow population growth?

Difficulty: 2

Question ID: 2.1-54

Page Ref: 41-42

Topic: Genes and Human Reproduction

Skill: Conceptual

Answer: B) Should we selectively abort embryos with tendencies toward specific diseases? *It is difficult to predict if*

a disease will develop, as it may depend on unknown environmental factors.

2.1-55. Which of the following laws was passed in 2008 to protect the genetic privacy of citizens?

- A) Americans with Disabilities Act
- B) Family and Medical Leave Act
- C) Genetic Information Nondiscrimination Act
- D) Employment Nondiscrimination Act

Difficulty: 3

Question ID: 2.1-55

Page Ref: 42

Topic: Genes and Human Reproduction

Skill: Factual

Answer: C) Genetic Information Nondiscrimination Act

2.1-56. Which of the following is a potential risk of discrimination based on the results of genetic testing?

- A) denying an individual health insurance
- B) denying an individual employment
- C) being fired or denied a promotion
- D) all of the above

Difficulty: 2

Question ID: 2.1-56

Page Ref: 42-43

Topic: Genes and Human Reproduction

Skill: Conceptual

Answer: D) all of the above. *Knowledge of one's genes (and potential traits) may result in denial of insurance, employment, or work opportunities.*

2.1-57. While applying for a job, Jessica is asked to submit a DNA sample for genetic testing. She should refuse the request because

- A) the employer may use the results of the test to deny her employment.
- B) genetic information is private.
- C) it is a violation of federal law for an employer to request or demand a genetic test.
- D) all of the above

Difficulty: 2

Question ID: 2.1-57

Page Ref: 42-43

Topic: Genes and Human Reproduction

Skill: Applied

Answer: D) all of the above. *The Genetic Information Nondiscrimination Act forbids employers to request or demand a genetic test. This information is private and cannot be used to deny someone employment.*

2.1-58. The relationship between genes in which the dominant allele will govern a particular trait and the recessive allele will be repressed is called the

- A) dominant-recessive relationship.
- B) dominant-recessive expression.
- C) genome.
- D) sex-linked relationship.

Difficulty: 1

Question ID: 2.1-58

Page Ref: 50

Topic: How Traits and Genetic Abnormalities Are Inherited

Skill: Factual

Answer: A) dominant-recessive relationship

2.1-59. Which of the following statements is true about any corresponding pair of alleles?

- A) The two alleles inherited are always the same.

- B) The two alleles inherited are always different.
- C) The two alleles inherited can be either the same or different.
- D) The two alleles inherited are never the same.

Difficulty: 1

Question ID: 2.1-59

Page Ref: 50

Topic: How Traits and Genetic Abnormalities Are Inherited

Skill: Factual

Answer: C) The two alleles inherited can be either the same or different.

2.1-60. When one of two parents has a _____ (e.g., Huntington's disease), there is at least a 50% chance that their offspring will inherit the disease.

- A) recessive disease allele
- B) dominant disease allele
- C) missing chromosome
- D) cross-over

Difficulty: 3

Question ID: 2.1-60

Page Ref: 50–51

Topic: How Traits and Genetic Abnormalities Are Inherited

Skill: Conceptual

Answer: B) dominant disease allele. *If a parent has one copy of a dominant disease allele, there is a 50-50 chance of giving it to their offspring. If the same parent has two copies of the allele, there is a 100% chance their offspring will inherit it.*

2.1-61. The gene for Huntington's disease has been identified on

- A) the fragile X.
- B) the 23rd chromosome pair.
- C) chromosome 4.
- D) none of the above

Difficulty: 3

Question ID: 2.1-61

Page Ref: 50–51

Topic: How Traits and Genetic Abnormalities Are Inherited

Skill: Factual

Answer: C) chromosome 4

2.1-62. All of the following traits are dominant traits EXCEPT

- A) inability to roll tongue.
- B) detached earlobes.
- C) dimpled cheeks.
- D) arched feet.

Difficulty: 3

Question ID: 2.1-62

Page Ref: 50

Topic: How Traits and Genetic Abnormalities Are Inherited

Skill: Factual

Answer: A) inability to roll tongue

2.1-63. Joanne's mother has arched feet, and her father has flat feet. Joanne will probably have

- A) arched feet.
- B) flat feet.
- C) large feet.
- D) The answer cannot be determined.

Difficulty: 2

Question ID: 2.1-63

Page Ref: 50

Topic: How Traits and Genetic Abnormalities Are Inherited

Skill: Applied

Answer: D) The answer cannot be determined. *While a range of probabilities can be estimated, the chances that Joanne will have either arched or flat feet cannot be determined until it is known whether her mother has one or two alleles for arched feet.*

2.1-64. Both of Madeline's parents have detached earlobes. The chance that she will develop the same trait is between

- A) 50% and 100%.
- B) 25% and 100%.
- C) 75% and 100%.
- D) The answer cannot be determined.

Difficulty: 3

Question ID: 2.1-64

Page Ref: 50

Topic: How Traits and Genetic Abnormalities Are Inherited

Skill: Applied

Answer: B) 25% and 100%. *Detached earlobes are a dominant trait. The minimum probability that Madeline will have detached earlobes (25%) is the scenario where both of her parents have one dominant allele, while the maximum probability (100%) is the scenario where both parents have two dominant alleles.*

2.1-65. Which of the following statements about cystic fibrosis (CF) is FALSE?

- A) CF affects tissues in the body that produce mucus secretions.
- B) People with CF usually experience serious respiratory problems.
- C) CF is the most common dominant disease among Caucasians.
- D) CF is nearly unknown in Asian populations.

Difficulty: 3

Question ID: 2.1-65

Page Ref: 51

Topic: How Traits and Genetic Abnormalities Are Inherited

Skill: Factual

Answer: C) CF is the most common dominant disease among Caucasians.

2.1-66. Which of the following allele patterns would an individual need to carry in order to express cystic fibrosis, a recessive gene disease, where C stands for a dominant allele and c stands for a recessive allele?

- A) CC
- B) Cc
- C) cc
- D) none of the above

Difficulty: 2

Question ID: 2.1-66

Page Ref: 52

Topic: How Traits and Genetic Abnormalities Are Inherited

Skill: Conceptual

Answer: C) cc. *Cystic fibrosis is a recessive disease, and so two copies of the allele must be inherited in order to develop the disease.*

2.1-67. Recessive traits are less common than dominant traits because usually

- A) both parents must have the same recessive trait in order for it to be inherited.
- B) both parents must either have the recessive trait or be a carrier in order for it to be inherited.
- C) recessive genes are more sensitive to the crossing-over process than dominant genes.
- D) only fathers are able to pass on recessive genes to their female offspring.

Difficulty: 2

Question ID: 2.1-67

Page Ref: 51

Topic: How Traits and Genetic Abnormalities Are Inherited

Skill: Factual

Answer: B) both parents must either have the recessive trait or be a carrier in order for it to be inherited

2.1-68. When one of two parents is a carrier for a _____ (e.g., cystic fibrosis), there is a 25% chance that their offspring will inherit the disease.

- A) dominant disease allele
- B) G x E interaction
- C) X-linked trait
- D) recessive disease allele

Difficulty: 3

Question ID: 2.1-68

Page Ref: 51-52

Topic: How Traits and Genetic Abnormalities Are Inherited

Skill: Factual

Answer: D) recessive disease allele

2.1-69. Your son comes home from kindergarten talking about a very sick classmate who has “sticky blood that is funny-shaped.” You wonder if this classmate might have

- A) cystic fibrosis.
- B) Huntington’s disease.
- C) sickle cell disease.
- D) trisomy X.

Difficulty: 2

Question ID: 2.1-69

Page Ref: 52

Topic: How Traits and Genetic Abnormalities Are Inherited

Skill: Applied

Answer: C) sickle cell disease. *One characteristic of sickle cell disease is malformed red blood cells.*

2.1-70. Sickle cell disease

- A) is a recessive gene disease.
- B) is a group of diseases involving defective hemoglobin.
- C) can be detected through prenatal genetic testing.
- D) all of the above

Difficulty: 2

Question ID: 2.1-70

Page Ref: 52

Topic: How Traits and Genetic Abnormalities Are Inherited

Skill: Factual

Answer: D) all of the above

2.1-71. X-linked recessive traits are

- A) more common among females than males.
- B) more common among males than females.
- C) equally common among females and males.
- D) none of the above; there is no data correlating X-linked recessive traits and sex.

Difficulty: 2

Question ID: 2.1-71

Page Ref: 52

Topic: How Traits and Genetic Abnormalities Are Inherited

Skill: Conceptual

Answer: B) more common among males than females. *Since men inherit one X chromosome, they only need to inherit one recessive X-linked allele in order to develop the corresponding trait. If women inherit a recessive X-linked allele, their second X chromosome may have a dominant allele that prevents expression of the recessive trait.*

2.1-72. Polygenic traits are traits influenced by

- A) dominant genes only.
- B) recessive genes only.
- C) many different genes.
- D) XX and XY genes only.

Difficulty: 3

Question ID: 2.1-72

Page Ref: 53

Topic: How Traits and Genetic Abnormalities Are Inherited

Skill: Applied

Answer: C) many different genes

2.1-73. Pleiotropic genes, a specific gene or group of genes, affect

- A) only one trait.
- B) more than one trait.
- C) emotional disposition in individuals.
- D) cognitive abilities, causing delayed development.

Difficulty: 2

Question ID: 2.1-73

Page Ref: 53

Topic: How Traits and Genetic Abnormalities Are Inherited

Skill: Applied

Answer: B) more than one trait

2.1-74. Relative to females, males are much more likely to suffer from classic hemophilia because

- A) when males inherit the recessive hemophilia gene on their X chromosomes, their Y chromosomes do not have a corresponding dominant gene to mask the disease.
- B) when males inherit the recessive hemophilia gene on their Y chromosomes, their X chromosomes do not have a corresponding dominant gene to mask the disease.
- C) only males can inherit the dominant gene responsible for the blood-clotting disease on the larger of their two sex chromosomes.
- D) when males inherit the dominant hemophilia gene on their Y chromosomes, it is highly likely that they will also carry the gene on their X chromosome.

Difficulty: 2

Question ID: 2.1-74

Page Ref: 53

Topic: How Traits and Genetic Abnormalities Are Inherited

Skill: Factual

Answer: A) when males inherit the recessive hemophilia gene on their X chromosomes, their Y chromosomes do not have a corresponding dominant gene to mask the disease

2.1-75. Fragile X syndrome is caused by

- A) the loss of an X chromosome during meiosis.
- B) a disease allele on one X chromosome causing the other X chromosome to become weak.
- C) the X chromosome (for girls) being weaker than the Y chromosome (for boys).
- D) the X chromosome being weakened at the tip.

Difficulty: 2

Question ID: 2.1-75

Page Ref: 53

Topic: How Traits and Genetic Abnormalities Are Inherited

Skill: Factual

Answer: D) the X chromosome being weakened at the tip

2.1-76. Which of the following is an example of a dominant X-linked trait?

- A) color blindness

- B) Duchenne muscular dystrophy
- C) Vitamin D-resistant rickets
- D) classic hemophilia

Difficulty: 2

Question ID: 2.1-76

Page Ref: 53

Topic: How Traits and Genetic Abnormalities Are Inherited

Skill: Factual

Answer: C) Vitamin D-resistant rickets

2.1-77. For females, the chances of inheriting a dominant disease allele on the X chromosome are _____ the chances for males.

- A) less than
- B) twice as likely as
- C) equal to
- D) half as likely as

Difficulty: 2

Question ID: 2.1-77

Page Ref: 53

Topic: How Traits and Genetic Abnormalities Are Inherited

Skill: Factual

Answer: B) twice as likely as

2.1-78. Which of the following is an example of a recessive X-linked trait?

- A) retinitis pigmentosa
- B) rickets
- C) Rett syndrome
- D) fragile X syndrome

Difficulty: 2

Question ID: 2.1-78

Page Ref: 53

Topic: How Traits and Genetic Abnormalities Are Inherited

Skill: Factual

Answer: A) retinitis pigmentosa

2.1-79. The number one inherited cause of mental retardation is

- A) Down syndrome.
- B) Tay-Sachs disease.
- C) fragile X syndrome
- D) Turner syndrome.

Difficulty: 3

Question ID: 2.1-79

Page Ref: 54

Topic: How Traits and Genetic Abnormalities Are Inherited

Skill: Factual

Answer: A) Down syndrome

2.1-80. Trisomy 21 is another name for

- A) Huntington's disease.
- B) Tay-Sachs disease.
- C) Down syndrome.
- D) fragile X mental retardation.

Difficulty: 2

Question ID: 2.1-80

Page Ref: 54

Topic: How Traits and Genetic Abnormalities Are Inherited

Skill: Factual

Answer: C) Down syndrome

2.1-81. Which of the following statements concerning Down syndrome is FALSE?

- A) Down syndrome is also referred to as Trisomy 21.
- B) In Down syndrome, there is a defective gene on the X chromosome.
- C) Down syndrome is the single most common genetic cause of mental retardation.
- D) In Down syndrome, babies are born with an extra 21st chromosome.

Difficulty: 2

Question ID: 2.1-81

Page Ref: 54

Topic: How Traits and Genetic Abnormalities Are Inherited

Skill: Factual

Answer: B) In Down syndrome, there is a defective gene on the X chromosome.

2.1-82. In about 95% of Down syndrome cases, the extra 21st chromosome exists because

- A) of a duplication error during mitosis.
- B) of injury that occurs during amniocentesis.
- C) the zygote becomes separated and divides into two zygotes.
- D) the 21st pair of chromosomes did not separate properly when the egg was formed.

Difficulty: 3

Question ID: 2.1-82

Page Ref: 54

Topic: How Traits and Genetic Abnormalities Are Inherited

Skill: Factual

Answer: D) the 21st pair of chromosomes did not separate properly when the egg was formed

2.1-83. Doctors recommend that pregnant women who are _____ or older should undergo genetic testing to determine if their fetus has an extra 21st chromosome.

- A) 25
- B) 35
- C) 45
- D) 55

Difficulty: 1

Question ID: 2.1-83

Page Ref: 55

Topic: How Traits and Genetic Abnormalities Are Inherited

Skill: Factual

Answer: B) 35

2.1-84. With the exception of trisomy 21, having an extra chromosome usually leads to

- A) pregnancy loss.
- B) death of the infant during the first few months of life.
- C) both A and B
- D) neither A nor B

Difficulty: 1

Question ID: 2.1-84

Page Ref: 55

Topic: How Traits and Genetic Abnormalities Are Inherited

Skill: Factual

Answer: C) both A and B

2.1-85. Which of the following sex chromosome abnormalities leads to a child who will be infertile?

- A) XYY syndrome
- B) Trisomy X
- C) Klinefelter syndrome

D) none of the above

Difficulty: 3

Question ID: 2.1-85

Page Ref: 55

Topic: How Traits and Genetic Abnormalities Are Inherited

Skill: Factual

Answer: C) Klinefelter syndrome

2.1-86. Turner syndrome results in all of the following characteristics EXCEPT

A) individuals remain fertile.

B) short stature.

C) infertility.

D) motor skill deficits.

Difficulty: 2

Question ID: 2.1-86

Page Ref: 55

Topic: How Traits and Genetic Abnormalities Are Inherited

Skill: Factual

Answer: A) individuals remain fertile

2.1-87. Your middle-school-aged daughter describes a new female classmate as “different.” She tells you that this classmate is quite short but has broad shoulders and a webbed neck. She also says that this classmate is clumsy in gym class and slow in geometry but okay in English. Of the following, which is most likely to be true?

A) Your daughter’s new classmate has Klinefelter syndrome.

B) Your daughter’s new classmate has trisomy X.

C) Your daughter’s new classmate is an XXX female.

D) Your daughter’s new classmate has Turner syndrome.

Difficulty: 3

Question ID: 2.1-87

Page Ref: 55

Topic: How Traits and Genetic Abnormalities Are Inherited

Skill: Applied

Answer: D) Your daughter’s new classmate has Turner syndrome. *The characteristics of Turner syndrome include a webbed neck, short stature, motor skill deficits, and difficulty in spatial processing.*

2.1-88. Your teenage son describes a new male classmate as “pretty weird.” He tells you that this classmate “looks more like a girl than a boy” because he’s not growing facial hair like other boys. He also says that the classmate seems to have difficulties reading and that a lot of kids don’t like him. Of the following, which is most likely to be true?

A) Your son’s new classmate is an XX male.

B) Your son’s new classmate is an XY female.

C) Your son’s new classmate is an XXY male.

D) Your son’s new classmate has Klinefelter syndrome.

Difficulty: 3

Question ID: 2.1-88

Page Ref: 55

Topic: How Traits and Genetic Abnormalities Are Inherited

Skill: Applied

Answer: D) Your son’s new classmate has Klinefelter syndrome. *The characteristics of Klinefelter syndrome include learning problems, shyness, and social immaturity.*

2.1-89. Which of the following sex chromosome abnormalities is due to an extra or missing chromosome?

A) Klinefelter syndrome

B) XXY syndrome

C) Turner syndrome

D) all of the above

Difficulty: 1

Question ID: 2.1-89

Page Ref: 55

Topic: How Traits and Genetic Abnormalities Are Inherited

Skill: Factual

Answer: D) all of the above

2.1-90. The doctor explains to Rita that at her next appointment a technician will use an instrument that sends sound waves through the abdomen to produce an image of internal structures. This technique is referred to as

- A) ultrasonography.
- B) amniocentesis.
- C) positron emission tomography.
- D) chorionic villus sampling.

Difficulty: 2

Question ID: 2.1-90

Page Ref: 56

Topic: How Traits and Genetic Abnormalities Are Inherited

Skill: Applied

Answer: A) ultrasonography. *During an ultrasound test, a technician uses an instrument that sends sound waves into the mother's abdomen.*

2.1-91. Which of the following procedures is NOT commonly utilized to detect genetic diseases during pregnancy?

- A) ultrasonography
- B) amniocentesis
- C) positron emission tomography
- D) chorionic villus sampling

Difficulty: 1

Question ID: 2.1-91

Page Ref: 56-58

Topic: How Traits and Genetic Abnormalities Are Inherited

Skill: Factual

Answer: C) positron emission tomography

2.1-92. An instrument that sends sound waves into the mother's abdomen to produce an image of the fetus is called

- A) ultrasonography.
- B) amniocentesis.
- C) positron emission tomography.
- D) chorionic villus sampling.

Difficulty: 1

Question ID: 2.1-92

Page Ref: 56

Topic: How Traits and Genetic Abnormalities Are Inherited

Skill: Factual

Answer: A) ultrasonography

2.1-93. A procedure used to detect genetic abnormalities in a fetus by extracting fetal cells from the amniotic fluid is called

- A) ultrasonography.
- B) amniocentesis.
- C) positron emission tomography.
- D) chorionic villus sampling.

Difficulty: 1

Question ID: 2.1-93

Page Ref: 56

Topic: How Traits and Genetic Abnormalities Are Inherited

Skill: Factual

Answer: B) amniocentesis

2.1-94. Amniocentesis can be conducted after

- A) the zygote has divided more than twice.
- B) the 4th week of pregnancy.
- C) the 14th week of pregnancy.
- D) the birth of the baby.

Difficulty: 2

Question ID: 2.1-94

Page Ref: 57

Topic: How Traits and Genetic Abnormalities Are Inherited

Skill: Factual

Answer: C) the 14th week of pregnancy

2.1-95. All of the following are possible complications of amniocentesis EXCEPT

- A) early labor contractions.
- B) miscarriage.
- C) changing the sex of the baby.
- D) bacterial infection from the needle.

Difficulty: 2

Question ID: 2.1-95

Page Ref: 57

Topic: How Traits and Genetic Abnormalities Are Inherited

Skill: Factual

Answer: C) changing the sex of the baby

2.1-96. Chorionic villus sampling works because the chorionic villus

- A) eventually forms the zygote, so the chromosomes and genetic codes are the same as those in the fetus will be.
- B) originates from the zygote, so the chromosomes and genetic codes are the same as those in the fetus.
- C) allows the mother and baby to share the same blood supply.
- D) contains all of the developing fetus's DNA and chromosomes.

Difficulty: 3

Question ID: 2.1-96

Page Ref: 57-58

Topic: How Traits and Genetic Abnormalities Are Inherited

Skill: Factual

Answer: B) originates from the zygote, so the chromosomes and genetic codes are the same as those in the fetus

2.1-97. The procedure used to detect chromosomal and genetic abnormalities in the fetus by removing cells from a layer of the placenta is called

- A) an ultrasound.
- B) an fMRI.
- C) amniocentesis.
- D) chorionic villus sampling.

Difficulty: 1

Question ID: 2.1-97

Page Ref: 57-58

Topic: How Traits and Genetic Abnormalities Are Inherited

Skill: Factual

Answer: D) chorionic villus sampling

2.1-98. Which of the following prenatal screening methods results in an image of the fetus' chromosomes?

- A) ultrasound
- B) amniocentesis
- C) chorionic villus sampling
- D) amniocentesis and chorionic villus sampling

Difficulty: 2

Question ID: 2.1-98

Page Ref: 56-58

Topic: How Traits and Genetic Abnormalities Are Inherited

Skill: Factual

Answer: D) amniocentesis and chorionic villus sampling

2.1-99. Toby was exposed to lead paint in his home when he was very young. If this exposure to a toxic chemical impacts his development, the impact would be due to _____ causes.

- A) genetic
- B) environmental
- C) canalization
- D) niche-picking

Difficulty: 1

Question ID: 2.1-99

Page Ref: 59-60

Topic: How Genes and Environments Interact

Skill: Applied

Answer: B) environmental. *Environmental influences include both social and physical factors that shape the course of development.*

2.1-100. The G x E interaction refers to the ways in which

- A) nature combines with nurture to produce a given outcome.
- B) genetics and education work together to produce intelligence in a child.
- C) a given outcome is multiplied by an expected outcome in a child's behavior.
- D) the range of possible phenotypes exist for a particular genotype.

Difficulty: 3

Question ID: 2.1-100

Page Ref: 60

Topic: How Genes and Environments Interact

Skill: Factual

Answer: A) nature combines with nurture to produce a given outcome

2.1-101. The G x E interaction describes how development is influenced by the interaction of

- A) genetics and evolution.
- B) nature and nurture.
- C) genetics and ethology.
- D) geography and environment.

Difficulty: 2

Question ID: 2.1-101

Page Ref: 60

Topic: How Genes and Environments Interact

Skill: Conceptual

Answer: B) nature and nurture. *The "G" represents biology, and in particular, genetic influences (nature), while the "E" represents the physical and social environment (nurture).*

2.1-102. The genetic code that a person inherits is called

- A) a karyotype.
- B) a genotype.
- C) a phenotype.
- D) canalization.

Difficulty: 1

Question ID: 2.1-102

Page Ref: 60

Topic: How Genes and Environments Interact

Skill: Factual

Answer: B) a genotype

2.1-103. _____ is the observable trait that a child shows.

- A) A karyotype
- B) A genotype
- C) A phenotype
- D) Canalization

Difficulty: 1

Question ID: 2.1-103

Page Ref: 60

Topic: How Genes and Environments Interact

Skill: Factual

Answer: C) A phenotype

2.1-104. Which of the following is an example of a phenotype?

- A) an extra X chromosome
- B) a mutation on chromosome 7
- C) an IQ of 117
- D) an allele on chromosome 4 for red hair color

Difficulty: 1

Question ID: 2.1-104

Page Ref: 60

Topic: How Genes and Environments Interact

Skill: Factual

Answer: C) an IQ of 117

2.1-105. The range of possible phenotypes that exist for a particular genotype is called

- A) a karyotype.
- B) canalization.
- C) a G x E interaction.
- D) a range of reaction.

Difficulty: 1

Question ID: 2.1-105

Page Ref: 60

Topic: How Genes and Environments Interact

Skill: Factual

Answer: D) a range of reaction

2.1-106. Joseph was born with Down syndrome. The range of possible IQs that he is likely to develop is _____ that of a typical child.

- A) smaller than
- B) larger than
- C) equal to
- D) unknown compared to

Difficulty: 2

Question ID: 2.1-106

Page Ref: 61

Topic: How Genes and Environments Interact

Skill: Applied

Answer: A) smaller than. *A major characteristic of Down syndrome is low IQ that is not strongly influenced or affected by the environment.*

2.1-107. In Waddington's "landscape," the shape of the landscape (e.g., the height and width of the pathways) is determined by

- A) the environment.
- B) dominant traits.

- C) genetics.
- D) social interaction with the primary caretaker.

Difficulty: 3

Question ID: 2.1-107

Page Ref: 60-62

Topic: How Genes and Environments Interact

Skill: Conceptual

Answer: C) genetics. *Genetics determines the range of possible outcomes, and the amount of influence that the environment can have on the particular developmental path that is followed.*

2.1-108. In Waddington's "landscape," _____ influences the particular path that is taken during development.

- A) the environment
- B) the child's genotype
- C) mitosis
- D) crossing-over

Difficulty: 3

Question ID: 2.1-108

Page Ref: 60-62

Topic: How Genes and Environments Interact

Skill: Conceptual

Answer: A) the environment. *The environment serves as a force that "moves" the individual around within the developmental landscape.*

2.1-109. Which of the following concepts places the heaviest emphasis on genetic determinism?

- A) canalization
- B) experiential canalization
- C) niche-picking
- D) probabilistic epigenesis

Difficulty: 2

Question ID: 2.1-109

Page Ref: 60-62

Topic: How Genes and Environments Interact

Skill: Conceptual

Answer: A) canalization. *A canalized trait or characteristic is one that is strongly influenced by genetics.*

2.1-110. Which of the following statements regarding the concept of reaction range is TRUE?

- A) Reaction range allows researchers to predict the phenotype that will be displayed by specific children.
- B) Reaction range is a theoretical concept that is helpful in understanding how genes and environment interact.
- C) Reaction range allows researchers to calculate all of the possible outcomes for any psychological characteristic.
- D) Reaction range helps explain how genes influence the choices children make in selecting their environments.

Difficulty: 3

Question ID: 2.1-110

Page Ref: 60

Topic: How Genes and Environments Interact

Skill: Conceptual

Answer: B) Reaction range is a theoretical concept that is helpful in understanding how genes and environment interact. *Reaction range helps provide an explanation for how a single genotype can result in a range of possible phenotypes, depending on the influence of the environment and the G x E interaction.*

2.1-111. _____ is the genetic limits on the effects of the environment.

- A) A karyotype
- B) A genotype
- C) A phenotype
- D) Canalization

Difficulty: 1

Question ID: 2.1-111

Page Ref: 60

Topic: How Genes and Environments Interact

Skill: Factual

Answer: D) Canalization

2.1-112. Which of the following is the BEST example of canalization?

- A) Jon and Jerry, MZ twins reared in highly different environments, have different temperaments as adults.
- B) Terry and May, who both have brown eyes, are the biological parents of Jessica, who has brilliant blue eyes.
- C) Regardless of when they are born, all human infants smile at exactly forty weeks after their conception.
- D) Keith, an XYY male, is tall for his age, of average intelligence, and currently having behavioral problems in school.

Difficulty: 3

Question ID: 2.1-112

Page Ref: 60-62

Topic: How Genes and Environments Interact

Skill: Applied

Answer: C) Regardless of when they are born, all human infants smile at exactly forty weeks after their conception. *A universal or widespread developmental outcome, which typically does not vary across environments, fits the pattern of canalization.*

2.1-113. The concept of resiliency—that some children grow up in challenging environments (e.g., violence, poverty, etc.) but still manage to develop normally—suggests that genetic limits may protect the individual from some negative environments. This protective influence of the genes is a form of

- A) shared environment.
- B) canalization.
- C) the dominant-recessive relationship.
- D) niche-picking.

Difficulty: 2

Question ID: 2.1-113

Page Ref: 60-62

Topic: How Genes and Environments Interact

Skill: Conceptual

Answer: B) canalization. *An advantage of canalized traits is that they resist the influence of negative environments, and therefore promote resiliency.*

2.1-114. Genetic determinism is a theory that states that

- A) environmental conditions must be strong to change an individual's developmental path.
- B) genetic conditions must be strong to change an individual's developmental path.
- C) the range of possible phenotypes that exist for a particular genotype depends upon stimulation.
- D) that developmental potential is determined by the stimulation in the child's environment.

Difficulty: 3

Question ID: 2.1-114

Page Ref: 62

Topic: How Genes and Environments Interact

Skill: Factual

Answer: A) environmental conditions must be strong to change an individual's developmental path

2.1-115. Until about one year of age, infants respond similarly to the basic sounds used in all languages. After that, they can detect subtle differences in language sounds only in their native language. Which of the following theories best supports this phenomenon?

- A) canalization
- B) experiential canalization
- C) genetic determinism
- D) probabilistic epigenesis

Difficulty: 3

Question ID: 2.1-115

Page Ref: 62

Topic: How Genes and Environments Interact

Skill: Conceptual

Answer: B) experiential canalization. *The concept of experiential canalization is that genetics provides a wide range of development outcomes, and the environment plays the limiting role.*

2.1-116. According to Gilbert Gottlieb's concept of experiential canalization, _____ provides a wide range of developmental outcomes, while _____ plays the limiting role.

- A) meiosis; mitosis
- B) nurture; nature
- C) genetics; the environment
- D) genotype; phenotype

Difficulty: 2

Question ID: 2.1-116

Page Ref: 62

Topic: How Genes and Environments Interact

Skill: Conceptual

Answer: C) genetics; the environment. *In contrast to the notion of genetic determinism, Gottlieb suggests that the environment may have a strong influence on developmental outcomes.*

2.1-117. During infancy, genes primarily operate in a(n) _____ manner.

- A) passive
- B) active
- C) evocative
- D) probabilistic

Difficulty: 2

Question ID: 2.1-117

Page Ref: 63

Topic: How Genes and Environments Interact

Skill: Conceptual

Answer: A) passive. *An infant's environment is almost totally controlled by his or her parents.*

2.1-118. Juanita, a 6-month-old infant, has parents who are outgoing and socialize frequently with friends and neighbors. Juanita's parents create the chance for her to interact with many different people. As a result, she also develops a personality that is similar to her parents. This example illustrates the _____ form of G x E interaction.

- A) genetic
- B) evocative
- C) active
- D) passive

Difficulty: 2

Question ID: 2.1-118

Page Ref: 62-63

Topic: How Genes and Environments Interact

Skill: Applied

Answer: D) passive. *As an infant, Juanita has little influence on her environment and is exposed to the kinds of influences that her family tends to select.*

2.1-119. When genetics play an "evocative" role in development, this means that the child's genetic tendencies

- A) constrict a child's range of reaction in a given situation.
- B) reduce the amount of G x E interaction that takes place.
- C) increase the likelihood that specific genes will become activated in a child's phenotype.
- D) bring about certain responses from parents and others.

Difficulty: 2

Question ID: 2.1-119

Page Ref: 63

Topic: How Genes and Environments Interact

Skill: Conceptual

Answer: D) bring about certain responses from parents and others. *An evocative G x E interaction means that genetic predispositions in the child tend to lead to particular reactions from others.*

2.1-120. _____ is the tendency to select activities and environments that fit with our genetic predispositions.

- A) Canalization
- B) Experiential canalization
- C) Niche-picking
- D) Probabilistic epigenesis

Difficulty: 1

Question ID: 2.1-120

Page Ref: 63

Topic: How Genes and Environments Interact

Skill: Factual

Answer: C) Niche-picking

2.1-121. Fifteen-year-old Jacob loves bluegrass music. He bought himself a used banjo with money he saved and regularly plays music with a local band. He keeps in contact with other musicians through the Internet and plans to move to Nashville when he graduates from high school. Jacob's behavior illustrates the

- A) active role of his genetic code.
- B) concept of niche-picking.
- C) evocative role of his genetic code.
- D) both A and B

Difficulty: 2

Question ID: 2.1-121

Page Ref: 63

Topic: How Genes and Environments Interact

Skill: Applied

Answer: D) both A and B. *Jacob is actively selecting and participating in his own environmental experiences.*

2.1-122. When Fred was a toddler, he began to scribble intensely with his crayons on every piece of scrap paper he was given. His parents thought that Fred showed a lot of aptitude as an artist and encouraged him to keep "drawing" by buying him paint sets, art books, and other artistic gifts for every birthday and holiday. Fred's parents response to his early behavior illustrates the

- A) evocative role of his genetic code.
- B) active role of his genetic code.
- C) passive role of his genetic code.
- D) concept of niche-picking.

Difficulty: 3

Question ID: 2.1-122

Page Ref: 63

Topic: How Genes and Environments Interact

Skill: Applied

Answer: A) evocative role of his genetic code. *Fred's behavior evoked in his parents a tendency to support his emerging interests in drawing.*

2.1-123. Niche-picking illustrates which form of the G x E interaction?

- A) passive
- B) active
- C) latent
- D) evocative

Difficulty: 2

Question ID: 2.1-123

Page Ref: 63

Topic: How Genes and Environments Interact

Skill: Conceptual

Answer: B) active. *Niche-picking is an example of actively selecting a particular environment.*

2.1-124. During _____, a trait, characteristic, or behavior emerges over the course of development.

- A) meiosis
- B) epigenesis
- C) canalization
- D) fertilization

Difficulty: 2

Question ID: 2.1-124

Page Ref: 63-64

Topic: How Genes and Environments Interact

Skill: Factual

Answer: B) epigenesis

2.1-125. _____ is the likelihood that specific environmental conditions will activate specific genes that lead to particular traits or behavioral outcomes.

- A) Canalization
- B) Experiential canalization
- C) Niche-picking
- D) Probabilistic epigenesis

Difficulty: 1

Question ID: 2.1-125

Page Ref: 63

Topic: How Genes and Environments Interact

Skill: Factual

Answer: D) Probabilistic epigenesis

2.1-126. Which of the following statements regarding probabilistic epigenesis is FALSE?

- A) Only about 10–15% of an individual's total genetic code is made active.
- B) A person's environment determines which parts of the genetic code are made active.
- C) Environmental changes can cause the activation of genes that are normally dormant.
- D) Genetic alterations caused by the environment cannot be passed on to offspring.

Difficulty: 3

Question ID: 2.1-126

Page Ref: 63-64

Topic: How Genes and Environments Interact

Skill: Conceptual

Answer: D) Genetic alterations caused by the environment cannot be passed on to offspring. *There is some evidence that changes in gene expression (caused by the environment) can be inherited.*

2.1-127. Which of the following is an example given in your text of behavioral evolution as a result of probabilistic epigenesis?

- A) salamanders having five legs
- B) birds developing teeth
- C) humans lacking thumbs
- D) cats growing two tails

Difficulty: 2

Question ID: 2.1-127

Page Ref: 63-64

Topic: How Genes and Environments Interact

Skill: Factual

Answer: B) birds developing teeth

2.1-128. Heritability means

- A) the degree of genetic influence on a given trait.
- B) experiences of the environment that are common to all individuals.
- C) experiences of the environment that are common to all individuals who are living together.
- D) experiences of the environment that differ across people.

Difficulty: 1

Question ID: 2.1-128

Page Ref: 66

Topic: Behavior Genetics: Measuring the Heritability of Traits

Skill: Factual

Answer: A) the degree of genetic influence on a given trait

2.1-129. Which of the following statements regarding heritability estimates is FALSE?

- A) Higher values of heritability estimates indicate stronger environmental influence.
- B) Theoretically, it is possible for heritability estimates to be as high as 1.0.
- C) Heritability estimates over .50 generally are considered fairly high.
- D) Complex traits never show heritability estimates as high as 1.0.

Difficulty: 2

Question ID: 2.1-129

Page Ref: 66

Topic: Behavior Genetics: Measuring the Heritability of Traits

Skill: Conceptual

Answer: A) Higher values of heritability estimates indicate stronger environmental influence. *Higher values of heritability indicate stronger genetic influence.*

2.1-130. Which of the following heritability estimates indicates the strongest genetic influence?

- A) Heritability estimate for attitudes toward racial integration is 0.06.
- B) Heritability estimate for religiosity is 0.22.
- C) Heritability estimate for IQ is 0.50.
- D) Heritability estimate for height is 0.90.

Difficulty: 2

Question ID: 2.1-130

Page Ref: 66

Topic: Behavior Genetics: Measuring the Heritability of Traits

Skill: Conceptual

Answer: D) Heritability estimate for height is 0.90. *Heritability varies from 0 to 1, with 1 reflecting the strongest possible influence of genetics.*

2.1-131. Traits with high heritability estimates provide support for the concept of

- A) canalization.
- B) genetic determinism.
- C) X-linked traits.
- D) both A and B

Difficulty: 2

Question ID: 2.1-131

Page Ref: 66-67

Topic: Behavior Genetics: Measuring the Heritability of Traits

Skill: Conceptual

Answer: D) both A and B. *A trait that is highly heritable does not tend to vary across environments and may therefore be canalized (i.e., strongly influenced by genetic factors).*

2.1-132. Heritability estimates can range from:

- A) -1.0 to +1.0.
- B) -1.0 to 0.
- C) 0 to +1.0.
- D) 0 to +2.0.

Difficulty: 1

Question ID: 2.1-132

Page Ref: 66

Topic: Behavior Genetics: Measuring the Heritability of Traits

Skill: Factual

Answer: C) 0 to +1.0

2.1-133. A heritability estimate of 0 means that variation in the trait being measured

- A) is determined by the genes.
- B) can be attributed to differences in the environment.
- C) cannot be reliably estimated.
- D) can be explained by genetic variation in the population.

Difficulty: 2

Question ID: 2.1-133

Page Ref: 66

Topic: Behavior Genetics: Measuring the Heritability of Traits

Skill: Conceptual

Answer: B) can be attributed to differences in the environment. *A heritability estimate of 0 indicates no variation in the trait can be linked to variations in genes across people.*

2.1-134. Shared environment means

- A) the degree of genetic influence on a given trait.
- B) experiences of the environment that are common to all individuals.
- C) experiences of the environment that are common to all individuals who are living together.
- D) experiences of the environment that differ across people.

Difficulty: 1

Question ID: 2.1-134

Page Ref: 67

Topic: Behavior Genetics: Measuring the Heritability of Traits

Skill: Factual

Answer: C) experiences of the environment that are common to all individuals who are living together

2.1-135. Nonshared environment means

- A) the degree of genetic influence on a given trait.
- B) experiences of the environment that are common to all individuals.
- C) experiences of the environment that are common to all individuals who are living together.
- D) experiences of the environment that differ across people.

Difficulty: 1

Question ID: 2.1-135

Page Ref: 67

Topic: Behavior Genetics: Measuring the Heritability of Traits

Skill: Factual

Answer: D) experiences of the environment that differ across people

2.1-136. Jack and Jill are siblings being raised in a very active household. The family attends many sporting events and participates in a wide range of athletic activities. Which of the following would be the BEST example of a nonshared environment?

- A) When they were toddlers, the family went on a five-day backpacking trip to Yellowstone.
- B) Their parents enforce a strict, daily regimen of at least thirty minutes of vigorous exercise.
- C) Their financial status allows the family to travel to upscale events, such as the Indianapolis 500 and the running of the bulls in Pamplona.
- D) Jack, a Special Olympian with Down syndrome, needs certain accommodations to participate in family sporting activities.

Difficulty: 2

Question ID: 2.1-136

Page Ref: 67

Topic: Behavior Genetics: Measuring the Heritability of Traits

Skill: Applied

Answer: D) Jack, a Special Olympian with Down syndrome, needs certain accommodations to participate in family sporting activities. *Jack's experiences during sporting activities differ from those of his sister.*

2.1-137. Imagine that a researcher measures a specific psychological characteristic (SPC) in pairs of siblings who are being reared together. She finds a correlation of .15 between pairs of adopted siblings who are biologically unrelated, a correlation of .63 for fraternal twins, and a correlation of .92 for identical twins. These results suggest that

- A) compared to the impact of the environment, genetics contributes relatively little to variability in the SPC.
- B) the shared environment contributes greatly to the variability in the SPC only among the identical twins.
- C) both the environment and genetics contribute substantially to the variability in the SPC.
- D) relative to the influence of genetics, the environment contributes relatively little to variability in the SPC.

Difficulty: 3

Question ID: 2.1-137

Page Ref: 66-67

Topic: Behavior Genetics: Measuring the Heritability of Traits

Skill: Applied

Answer: D) relative to the influence of genetics, the environment contributes relatively little to variability in the SPC. *Increasingly strong, positive correlations for a trait, as a function of genetic relatedness, indicate that the trait has a significant genetic component.*

2.1-138. Twin studies make comparisons between the measurements of

- A) identical twins only.
- B) nonidentical twins only.
- C) identical twins and nonidentical twins.
- D) identical twins, nonidentical twins, and nontwin siblings.

Difficulty: 1

Question ID: 2.1-138

Page Ref: 67

Topic: Behavior Genetics: Measuring the Heritability of Traits

Skill: Factual

Answer: C) identical twins and nonidentical twins

2.1-139. Adoption studies estimate the genetic contribution to a given trait by studying

- A) adopted children only.
- B) adopted children and their biological family.
- C) adopted children, their biological family, and their adoptive parents.
- D) none of the above.

Difficulty: 1

Question ID: 2.1-139

Page Ref: 67

Topic: Behavior Genetics: Measuring the Heritability of Traits

Skill: Factual

Answer: D) none of the above

2.1-140. One of the primary reasons that behavior geneticists study identical twins is because they are

- A) usually reared within the same family.
- B) generally treated similarly by the people around them.
- C) more likely to engage in active niche-picking.
- D) more genetically similar than other biological siblings.

Difficulty: 2

Question ID: 2.1-140

Page Ref: 67

Topic: Behavior Genetics: Measuring the Heritability of Traits

Skill: Conceptual

Answer: D) more genetically similar than other biological siblings. *Identical or monozygotic twins share 100% of*

their genetic material.

2.1-141. If there is an important genetic influence on a given trait, then the correlation for _____ should be significantly higher than the correlation for _____.

- A) MZ twins; DZ twins
- B) DZ twins; nontwin siblings
- C) mother-child; father-child
- D) nontwin siblings; MZ twins

Difficulty: 3

Question ID: 2.1-141

Page Ref: 67

Topic: Behavior Genetics: Measuring the Heritability of Traits

Skill: Conceptual

Answer: A) MZ twins; DZ twins *MZ twins share 100% of their genes, while DZ twins share 50%. For heritable traits, therefore, it is more likely that the trait will be correlated across MZ twins.*

2.1-142. Sally is participating in an adoption study. Sally was adopted when she was seven months old. Her biological family could be characterized as Caucasian, middle-class, from an urban setting in the northeastern United States. She was placed with an adoptive family that could be characterized as being Caucasian, middle-class, from an urban setting in the northeastern United States. Sally's adoption presents what potential problem for the researchers of the adoption study?

- A) heritability
- B) probabilistic epigenesis
- C) selective placement
- D) equal environments

Difficulty: 3

Question ID: 2.1-142

Page Ref: 67–68

Topic: Behavior Genetics: Measuring the Heritability of Traits

Skill: Applied

Answer: C) selective placement. *Sally has been placed with an adoptive family that was specifically chosen to be similar to her biological family. This makes it difficult to separate the influences of genes versus environment on her development.*

2.1-143. In adoption studies, the phenomenon of selective placement means that

- A) children are permitted to select their adoptive parents.
- B) children may be placed with adoptive parents that are similar to the biological parents.
- C) the biological parents are permitted to select the adoptive parents.
- D) children are randomly matched to adoptive parents.

Difficulty: 1

Question ID: 2.1-143

Page Ref: 67-68

Topic: Behavior Genetics: Measuring the Heritability of Traits

Skill: Conceptual

Answer: B) children may be placed with adoptive parents that are similar to the biological parents. *Adoption agencies may tend to place a child with an adoptive family that is similar in important ways to the child's biological family.*

2.1-144. _____ involve(s) the assumption in twin studies that the environment for identical twins is the same as nonidentical twins.

- A) Heritability
- B) Probabilistic epigenesis
- C) Selective placement
- D) Equal environments

Difficulty: 2

Question ID: 2.1-144

Page Ref: 68

Topic: Behavior Genetics: Measuring the Heritability of Traits

Skill: Factual

Answer: D) Equal environments

2.1-145. In terms of heritability estimates for certain traits and characteristics, which of the following traits is NOT considered to be a characteristic of temperament?

- A) processing speed
- B) anxiety
- C) masculinity/femininity
- D) belief in God

Difficulty: 1

Question ID: 2.1-145

Page Ref: 68-70

Topic: Behavior Genetics: Measuring the Heritability of Traits

Skill: Factual

Answer: A) processing speed

2.1-146. Which of the following cognitive skills has the highest heritability estimate?

- A) spatial reasoning
- B) general intelligence
- C) English usage
- D) processing speed

Difficulty: 3

Question ID: 2.1-146

Page Ref: 68-70

Topic: Behavior Genetics: Measuring the Heritability of Traits

Skill: Factual

Answer: B) general intelligence

2.1-147. Which of the following psychological disorders has the highest heritability estimate?

- A) bipolar disorder
- B) schizophrenia
- C) autism spectrum disorders
- D) hyperactivity (adolescent males)

Difficulty: 3

Question ID: 2.1-147

Page Ref: 69

Topic: Behavior Genetics: Measuring the Heritability of Traits

Skill: Factual

Answer: C) autism spectrum disorders

2.1-148. Behavior geneticists generally estimate the heritability of IQ is about

- A) 0.
- B) .20.
- C) .35.
- D) .50.

Difficulty: 2

Question ID: 2.1-148

Page Ref: 68

Topic: Behavior Genetics: Measuring the Heritability of Traits

Skill: Factual

Answer: D) .50

2.1-149. Several studies have shown that heritability estimates for some cognitive skills _____ with age.

- A) decrease

- B) are not correlated with
- C) increase
- D) first increase, and then decrease

Difficulty: 2

Question ID: 2.1-149

Page Ref: 70

Topic: Behavior Genetics: Measuring the Heritability of Traits

Skill: Factual

Answer: C) increase

2.1-150. Which of the following concepts may explain how the relative influence of genetics on cognitive skills appears to become stronger the older a person gets?

- A) dominant-recessive relationship
- B) niche-picking
- C) shared environment
- D) epigenesis

Difficulty: 3

Question ID: 2.1-150

Page Ref: 70

Topic: Behavior Genetics: Measuring the Heritability of Traits

Skill: Conceptual

Answer: B) niche-picking. *The older an individual becomes, the more their active selection of specific environments (which is genetically influenced) shapes their development.*

2.1-151. Which of the following traits is NOT characterized as an aspect of temperament?

- A) anxiety
- B) sociability
- C) emotionality
- D) intelligence

Difficulty: 1

Question ID: 2.1-151

Page Ref: 69

Topic: Behavior Genetics: Measuring the Heritability of Traits

Skill: Factual

Answer: D) intelligence

2.1-152. _____ is a child's activity level and pattern of response to stimulation.

- A) Intelligence
- B) Temperament
- C) Hyperactivity
- D) Impulsivity

Difficulty: 1

Question ID: 2.1-152

Page Ref: 71-72

Topic: Behavior Genetics: Measuring the Heritability of Traits

Skill: Factual

Answer: B) Temperament

2.2 True/False Questions

2.2-1. Genes are molecules that dictate how our cells develop and coordinate to form the human body.

Difficulty: 2

Question ID: 2.2-1

Page Ref: 40

Topic: Genes and Human Reproduction

Skill: Conceptual

Answer: TRUE

2.2-2. It takes approximately 90 percent of the nucleotide base pairs to provide active instructions.

Difficulty: 3

Question ID: 2.2-2

Page Ref: 40

Topic: Genes and Human Reproduction

Skill: Factual

Answer: FALSE

2.2-3. Research on artificial insemination and in vitro fertilization (Golombok, et al.) has found that there are more developmental problems when children are conceived by these methods.

Difficulty: 2

Question ID: 2.2-3

Page Ref: 48

Topic: Genes and Human Reproduction

Skill: Factual

Answer: FALSE

2.2-4. Sperm can be collected and frozen and are still viable, even if thawed several years later.

Difficulty: 1

Question ID: 2.2-4

Page Ref: 48

Topic: Genes and Human Reproduction

Skill: Factual

Answer: TRUE

2.2-5. Research on artificial insemination and in vitro fertilization (Golombok, et al.) has found that mothers who use these techniques tend to be more warm and involved with their children compared to other mothers.

Difficulty: 3

Question ID: 2.2-5

Page Ref: 48-49

Topic: Genes and Human Reproduction

Skill: Factual

Answer: TRUE

2.2-6. Mitosis is the type of cell division used to create gametes.

Difficulty: 1

Question ID: 2.2-6

Page Ref: 43

Topic: Genes and Human Reproduction

Skill: Factual

Answer: FALSE

2.2-7. When women take fertility drugs when they are having difficulty conceiving, most of the twins born while on these drugs are identical twins.

Difficulty: 2

Question ID: 2.2-7

Page Ref: 48

Topic: Genes and Human Reproduction

Skill: Applied

Answer: FALSE

2.2-8. Scientists refer to identical twins as monozygotic twins.

Difficulty: 1

Question ID: 2.2-8

Page Ref: 46

Topic: Genes and Human Reproduction

Skill: Factual

Answer: TRUE

2.2-9. Dizygotic twinning occurs more often in Asian populations than in African populations.

Difficulty: 2

Question ID: 2.2-9

Page Ref: 46-47

Topic: Genes and Human Reproduction

Skill: Factual

Answer: FALSE

2.2-10. Scientists have completed their mapping and positioning of the order of 3 billion pairs of nucleotide bases in the human genome.

Difficulty: 2

Question ID: 2.2-10

Page Ref: 40

Topic: Genes and Human Reproduction

Skill: Applied

Answer: FALSE

2.2-11. Mutations that occur in an individual's genetic code may be passed down to the next generation.

Difficulty: 1

Question ID: 2.2-11

Page Ref: 50

Topic: How Traits and Genetic Abnormalities Are Inherited

Skill: Factual

Answer: TRUE

2.2-12. Huntington's disease is the most common example of a recessive gene disease.

Difficulty: 2

Question ID: 2.2-12

Page Ref: 50

Topic: How Traits and Genetic Abnormalities Are Inherited

Skill: Factual

Answer: FALSE

2.2-13. Cystic fibrosis is the most common example of a recessive gene disorder.

Difficulty: 2

Question ID: 2.2-13

Page Ref: 51

Topic: How Traits and Genetic Abnormalities Are Inherited

Skill: Factual

Answer: TRUE

2.2-14. Abnormalities in the structure or number of whole chromosomes are present in 1 of every 160 live births.

Difficulty: 2

Question ID: 2.2-14

Page Ref: 54

Topic: How Traits and Genetic Abnormalities Are Inherited

Skill: Factual

Answer: TRUE

2.2-15. A karyotype is the genetic code a person inherits.

Difficulty: 2

Question ID: 2.2-15

Page Ref: 56-57

Topic: How Traits and Genetic Abnormalities Are Inherited

Skill: Factual

Answer: FALSE

2.2-16. Amniocentesis can be conducted after the 8th week of pregnancy.

Difficulty: 2

Question ID: 2.2-16

Page Ref: 56-57

Topic: How Traits and Genetic Abnormalities Are Inherited

Skill: Factual

Answer: FALSE

2.2-17. One way that a child's genes interact with the environment is by affecting the kinds of environments that are available.

Difficulty: 3

Question ID: 2.2-17

Page Ref: 59-62

Topic: How Genes and Environments Interact

Skill: Conceptual

Answer: TRUE

2.2-18. It is the individual's environment that controls which parts of the genome are activated, according to the probabilistic epigenesis theory.

Difficulty: 2

Question ID: 2.2-18

Page Ref: 63-64

Topic: How Genes and Environments Interact

Skill: Conceptual

Answer: TRUE

2.2-19. The higher the value of a heritability estimate is, the stronger the environmental influence on that trait or behavior.

Difficulty: 2

Question ID: 2.2-19

Page Ref: 66-67

Topic: Behavior Genetics: Measuring the Heritability of Traits

Skill: Conceptual

Answer: FALSE

2.2-20. Researchers have calculated the vast majority of personality heritability estimates based on self-report or parent-report questionnaires.

Difficulty: 2

Question ID: 2.2-20

Page Ref: 67-68

Topic: Behavior Genetics: Measuring the Heritability of Traits

Skill: Conceptual

Answer: TRUE

2.3 Short Answer Questions

2.3-1. There are _____ pairs of chromosomes.

Difficulty: 1

Question ID: 2.3-1

Page Ref: 39

Topic: Genes and Human Reproduction

Skill: Factual

Answer: 23

2.3-2. _____ always pairs with thymine.

Difficulty: 2

Question ID: 2.3-2

Page Ref: 40

Topic: Genes and Human Reproduction

Skill: Factual

Answer: Adenine

2.3-3. _____ always pairs with guanine.

Difficulty: 2

Question ID: 2.3-3

Page Ref: 40

Topic: Genes and Human Reproduction

Skill: Factual

Answer: Cytosine

2.3-4 When the sperm and egg cells join, chromosomes from the father and mother combine to give the embryo unique versions of particular genes called _____.

Difficulty: 3

Question ID: 2.3-4

Page Ref: 43

Topic: Genes and Human Reproduction

Skill: Conceptual

Answer: alleles

2.3-5. _____ is the type of cell division that occurs when chromosomes are copied into each new cell.

Difficulty: 2

Question ID: 2.3-5

Page Ref: 43

Topic: Genes and Human Reproduction

Skill: Factual

Answer: Mitosis

2.3-6. _____ is the type of cell division that occurs during the formation of gametes.

Difficulty: 2

Question ID: 2.3-6

Page Ref: 44

Topic: Genes and Human Reproduction

Skill: Factual

Answer: Meiosis

2.3-7. The _____ is a multinational effort by governments and scientists to map the 3 billion pairs of nucleotide bases and genes in humans.

Difficulty: 1

Question ID: 2.3-7

Page Ref: 40

Topic: Genes and Human Reproduction

Skill: Factual

Answer: Human Genome Project

2.3-8. _____, also called Down syndrome, is a genetic disorder that occurs when there is an extra 21st chromosome.

Difficulty: 2

Question ID: 2.3-8

Page Ref: 54

Topic: How Traits and Genetic Abnormalities Are Inherited

Skill: Factual

Answer: Trisomy 21

2.3-9. The _____ refers to the ways in which nature combines with nurture to produce a given outcome.

Difficulty: 3

Question ID: 2.3-9

Page Ref: 60

Topic: How Genes and Environments Interact

Skill: Factual

Answer: G x E interaction

2.3-10. _____ states that the environment limits the expression of genes.

Difficulty: 3

Question ID: 2.3-10

Page Ref: 62

Topic: How Genes and Environments Interact

Skill: Factual

Answer: Experiential canalization

2.3-11. _____ refers to the way that genes limit developmental outcomes.

Difficulty: 3

Question ID: 2.3-11

Page Ref: 60-61

Topic: How Genes and Environments Interact

Skill: Factual

Answer: Canalization

2.3-12. Heritability estimates range from 0.00 to _____.

Difficulty: 1

Question ID: 2.3-12

Page Ref: 66

Topic: Behavior Genetics: Measuring the Heritability of Traits

Skill: Factual

Answer: 1.00

2.4 Essay Questions

2.4-1. Understanding human genes and their specific combinations and expressions is very important in understanding the nature and behavior of a child. Define the term DNA and explain the four different varieties of nucleotide base molecules that are a part of it. Be sure to discuss how these molecules pair together and create the larger sequences that make up our individual genetic codes.

Difficulty: 2

Question ID: 2.4-1

Page Ref: 39-45

Topic: Genes and Human Reproduction

Skill: Conceptual

Answer: Students' answers will vary but should include an understanding that DNA is the two strands of molecules that twist around each other, connected by a series of nucleotide bases. These bases (adenine, thymine, guanine, and cytosine) pair together (A with T and G with C) to create approximately 3 billion pairs of nucleotide bases that make

up the genetic code (genome), which is a set of instructions that determines which traits are inherited.

2.4-2. Your textbook listed five alternative techniques for conception. Define three of these techniques and then compare and contrast the procedures used in each to achieve conception.

Difficulty: 1

Question ID: 2.4-2

Page Ref: 48-49

Topic: Genes and Human Reproduction

Skill: Conceptual

Answer: Students' answers will vary depending upon which of the alternative techniques for conception that they wish to discuss.

2.4-3. In order to appreciate the impact of genetic inheritance on development, it is important to understand the process of cell division. Explain what a zygote is and then describe the processes of mitosis and meiosis that take place in the developing organism.

Difficulty: 2

Question ID: 2.4-3

Page Ref: 43-45

Topic: Genes and Human Reproduction

Skill: Factual

Answer: A zygote is the human organism after the fertilized egg cell begins to divide. These divisions take place in two ways: mitosis and meiosis. Mitosis is the type of cell division that occurs when chromosomes are copied into each new cell. During this division, the DNA material on each chromosome "unzips." The weak bonds between the nucleotide bases on opposite sides of the staircase break. It forms two new strands that then link up with the two old strands and wrap up again to make two new chromosomes. Meiosis is the type of cell division that occurs during the formation of gametes (or sperm and eggs). This process reduces the number of chromosomes in these cells from 46 to 23.

2.4-4. The Human Genome Project (HGP) has been a gigantic scientific undertaking, which has caused amazing developments in the fields related to child psychology. Explain the nature, purpose, and work product of the Human Genome Project. Then, discuss the impact of the findings of the HGP on pregnancy choices, disease therapy, and ethical dilemmas surrounding its use.

Difficulty: 3

Question ID: 2.4-4

Page Ref: 40-43

Topic: Genes and Human Reproduction

Skill: Conceptual

Answer: Students' answers will vary depending on what aspects they choose to discuss.

2.4-5. Chromosome abnormalities can cause a number of serious genetic defects in children. One such defect is Down syndrome. Define Down syndrome and outline what causes this disorder. Then, discuss the physical and intellectual effects that this genetic disorder has on the developing child. Finally, describe the number one possible risk factor for giving birth to a Down syndrome child.

Difficulty: 3

Question ID: 2.4-5

Page Ref: 54-55

Topic: How Traits and Genetic Abnormalities Are Inherited

Skill: Factual

Answer: Down syndrome, also called trisomy 21, occurs when babies are born with an extra 21st chromosome. Individuals with Down syndrome typically have a flattened nose, tightened eyelids, low-set ears, and short neck. They also are short in stature have short and broad hands, and tend to have heart problems and a shortened life span. Also, people with Down syndrome have mental retardation with IQs typically between 25 and 50. In 95 percent of Down syndrome cases, the extra 21st chromosome exists because the 21st chromosome pair did not separate normally when the egg was formed. The number one risk factor for giving birth to a Down syndrome child is to become pregnant after age 35.

2.4-6. Tina was having trouble conceiving a child. She went to the doctor to determine if she could have a child. After running some blood tests, it was determined that Tina has Turner syndrome. Explain what Turner syndrome is and then determine whether or not Tina is fertile.

Difficulty: 2

Question ID: 2.4-6

Page Ref: 55

Topic: How Traits and Genetic Abnormalities Are Inherited

Skill: Applied

Answer: Students' answers will vary but should contain an understanding of the following: Turner syndrome is a sex chromosome abnormality, where girls are missing one of their X chromosomes. It occurs in roughly 1/2,000 females. It results in a short stature, webbed neck, broad shoulders, spatial perception and motor skill deficits, as well as a range of other health problems. Individuals with Turner syndrome are infertile, so Tina will not be able to conceive a child naturally.

2.4-7. In order to complete genetic testing during pregnancy, there are two ways that fetal cells can be collected. Name each of these two procedures and explain the difference between the two ways that the cells are extracted and what type of cells each procedure is attempting to procure.

Difficulty: 2

Question ID: 2.4-7

Page Ref: 56-58

Topic: How Traits and Genetic Abnormalities Are Inherited

Skill: Factual

Answer: Students' answers will vary but should contain an understanding of the following: With amniocentesis, a needle is inserted through the mother's abdomen and into the amniotic sac. Amniotic fluid is withdrawn, containing cells sloughed off from the fetus. With chorionic villus sampling (CVS), either a catheter is inserted through the vagina and into the uterus to take placental villus cells or the villus cells are extracted using a needle inserted into the placenta.

2.4-8. In the course of development, one of the ways that a child's genes interact with the environment is by affecting the kinds of environments that are available. One example of this process is the concept of niche-picking. Define niche-picking and then elaborate on how genetics operate in a passive, evocative, and active manner.

Difficulty: 2

Question ID: 2.4-8

Page Ref: 60-65

Topic: How Genes and Environments Interact

Skill: Conceptual

Answer: Niche-picking is the tendency to pick activities and environments that fit with our genetic predispositions. During infancy, genes primarily operate in a passive manner. At this stage, the infant's environment is almost totally controlled by his or her parents. However, the child and the parents share many genes, so the home environment is usually consistent with and supportive of the child's genes. As the child gets older, genes play a more evocative role. This means that the child's genetic tendencies evoke certain responses from parents and others. These responses are evoked by and tend to support the child's genetic tendencies. Finally, as children get older and have more freedom to choose their own activities, genes work in an active way. Older children can actively seek out the specific niches, or activities and environments that suit them best.

2.5 MyDevelopmentLab Questions

2.5-1. Briefly describe the number of chromosomes in a human cell and how chromosomes are related to genes. Next, continue your description by explaining how dominant and recessive traits can be understood through the interaction of genes.

Difficulty: 1

Question ID: 2.5-1

Page Ref: MDL

Topic: Dominant and Recessive Traits

Skill: Conceptual

Answer: All cells in the body, other than the sex cells, have 46 chromosomes. The sex cells, or gametes (eggs for women, and sperm for men), have 23 chromosomes. After conception, the fertilized egg has 46 chromosomes. Each chromosome is divided into a set of functional units called genes. For most traits, an offspring inherits two genes (one on each pair of chromosomes). Dominant genes are always expressed, while recessive genes are only expressed when the offspring inherits two copies of the recessive gene.

2.5-2. How will completion of the Human Genome Project affect you?

Difficulty: 2

Question ID: 2.5-2

Page Ref: MDL

Topic: [How the Human Genome Map Affects You](#)

Skill: Conceptual

Answer: While there are no immediate benefits from the completion of the Human Genome Project, potential long-term implications include more personalized medical treatments, such as customized drugs, as well as rapid advances in gene therapies.

2.5-3. Describe “junk DNA” and how ongoing genetic studies may help reveal how it functions in important ways.

Difficulty: 2

Question ID: 2.5-3

Page Ref: MDL

Topic: Junk DNA

Skill: Conceptual

Answer: Less than 2% of human DNA has an identified role. The remaining DNA is called “junk DNA,” as it appears to serve no obvious purpose. However, recent research has found that long stretches of junk DNA are shared by humans and other animals, such as mice. This finding suggests that this DNA is not unimportant, but that it may in fact play a valuable role in biological functions such as aging or disease.