

Answer Key

Subtest 1: Verbal Analogies

1. a. The head of a school is its *principal* and the head of an office is its *manager*. Although a secretary works in an office, he or she is not the head of the office, so choice **b** is incorrect. Choice **c** is incorrect because a computer is a tool used in an office. Choice **d** is incorrect because a teacher works in a school, not an office, and is not the head of either. A building is where schools and offices are located and does not explain who the head of an office is, so choice **e** is incorrect.
2. b. A painter manipulates paint by *brushing* it and a sculptor manipulates clay by *molding* it. Choices **a** and **e** are incorrect because they describe other substances a sculptor can mold. Choice **c** is wrong because it describes the end result of molding clay but fails to address how the clay is manipulated. Choice **d** is incorrect because it describes the person who works with clay.
3. c. A function of a knife is to *slice* and a function of a spoon is to *stir*. Choice **a** is incorrect because a fork is just another kind of kitchen utensil. Choice **b** is wrong because it just describes another function of a knife. Choice **d** is something one might eat with a spoon and choice **e** is a part of a spoon, so these are incorrect as well.
4. e. *Brag* is the action of a person who is proud and *weep* is the action of a person who is despairing. A person who is despairing, or sad, is not likely to sing (**a**) or to exult (**b**). Choice **c** is incorrect because sad has a similar meaning to despairing but does not describe what a despairing person does. To depress is to have a despairing effect on someone, so choice **d** is incorrect.
5. b. *Thrilled* is an intensified form of *excited* and *enraged* is an intensified form of *angered*. Choices **a**, **c**, **d**, and **e** are incorrect because they do not describe intensified forms of *angered*.
6. b. The *string* is the part of the *guitar* that produces sound and the *key* is the part of the *organ* that produces sound. Choices **a**, **c**, **d**, and **e** all refer to music without specifying the instrument that uses keys to produce its sound.
7. e. A *thesaurus* is a book of *synonyms* and a *dictionary* is a book of *definitions*. Both books focus on words and both are reference books, so a more specific answer than choices **a**, **b**, **c**, and **d** is required.
8. e. A *bust* sits atop a *pedestal* and a *camera* sits atop a *tripod*. Choices **a**, **b**, **c**, and **d** are incorrect because none of them explain what sits atop a tripod.
9. b. A *beautician* works in a *salon*; a *musician* works in a *concert hall*.
10. d. An *engine stalls* when it ceases to function; a *computer freezes* when it ceases to function.
11. c. To *bolt* is to *leave quickly*; to *race* is to *drive quickly*.
12. d. *Disseminate* and *gather* are antonyms; *rip* and *mend* are antonyms.
13. e. *Adore* is an intensified form of *enjoy*; *loathe* is an intensified form of *dislike*.
14. e. A group of geese is a *gaggle*; a group of sheep is a *flock*.
15. d. Science fiction is a genre of literature one might read in a *novel*; rhythm and blues is a genre of music one might listen to on an *album*.
16. d. *Constructive* is a trait of a *carpenter*; *judgmental* is a trait of a *critic*.
17. b. *Carelessness* can lead to a *mistake*; *meticulousness* can lead to *perfection*.
18. b. *Cautious* and *heedless* are antonyms; *wary* and *trusting* are antonyms.

19. b. To *jump* is the physical reaction to being *surprised*; to *chuckle* is the physical reaction to being *amused*.
20. c. *Brace* and *bolster* are synonyms; *accelerate* and *hasten* are synonyms.
21. a. A *spider* is a kind of *arachnid*; a *lobster* is a kind of *crustacean*.
22. d. *Psychology* is the study of the *mind*; *anatomy* is the study of the *body*.
23. b. A *cardiologist* is a doctor specializing in the *heart*; a *neurologist* is a doctor specializing in the *brain*.
24. b. A group of *peas* is a *bushel*; a group of *bananas* is a *bunch*.
25. a. *Apathy* and *disinterest* are synonyms; *tenacity* and *resolve* are synonyms.
8. b. This problem is solved by multiplying 35 times 8.2.
9. c. You know the ratio of Drake's charge to Jean's charge is 3 to 4, or $\frac{3}{4}$. To find what Jean charges, you use the equation $\frac{3}{4} = \frac{36}{x}$, or $3x = 4(36)$; $(4)(36) = 144$, which is then divided by 3 to arrive at $x = 48$.
10. a. In this question, you need to find 15% of the 30% of cadet athletes that play lacrosse. To find 15% of 30%, change the percents to decimal form and multiply. Since $30\% = 0.30$ and $15\% = 0.15$, multiply $(0.30)(0.15) = 0.045$. As a decimal, this is equivalent to 4.5%.
11. d. The basic cable service fee of \$15 is 75% of \$20.
12. a. The labor fee (\$25) plus the deposit (\$65) plus the basic service (\$15) equals \$105. The difference between the total bill, \$112.50, and \$105 is \$7.50, the cost of the news channels.
13. c. 60 out of 200 is 30%. Thirty percent of 40,000 is 12,000.
14. d. 27.5% of 400 is 110.
15. b. Rock is 45.5%; when we add 4.5% for classical we arrive at 50%.
16. c. If 60% of the people were satisfied with their new car, 40% were unsatisfied; 40% of 220 is 88.
17. c. Divide 135 Spanish-speaking candidates by 1,125 total number of candidates to arrive at .12 or 12%.
18. b. The first step in solving the problem is to subtract 156 from 268. $268 - 156 = 112$. The remainder, 112, is then divided by 2. $112 \div 2 = 56$.
19. c. Three feet 4 inches equals 40 inches; 40 divided by 5 is 8.

Subtest 2: Arithmetic Reasoning

1. e. Since the price per copy is \$0.85, divide 68 by .85 to find the total number that can be purchased with \$68; $68 \div .85 = 80$ copies that can be purchased.
2. c. The volume of the aquarium can be found by using the formula $V = l \times w \times h$. Since the length is 12 inches, the width is 5 inches and the height is 10 inches, multiply $V = 12 \times 5 \times 10$ to get a volume of 600 cubic inches.
3. c. The value of the handbag (\$150) must be included in the total.
4. d. Both choices **a** and **b** can be ruled out because there is no way to determine how many tickets are for adults or for children. Choice **c** can be ruled out because the price of group tickets is not given.
5. d. Because the 15-year-old requires an adult ticket, there are 3 adult tickets at \$7.50 each and one child's ticket at \$5.
6. a. The adult price on Saturday afternoon is \$5.50; the child's price is \$3.00.
7. d. This problem is solved by dividing 60 by 0.50. $60 \div .50 = 120$.

- 20. a.** It will cost \$3 for a sandwich and a cookie. To get two additional sandwiches, it would cost another \$4. Therefore, it would cost \$7 to get three sandwiches and a cookie. Since she only has \$6 to spend, this combination is not possible.
- 21. c.** Area = width \times length. In this case, $4 \times 6 = 24$ square feet.
- 22. b.** Use the formula beginning with the operation in parentheses: $98 - 32 = 66$. Then multiply 66 by $\frac{5}{9}$, first multiplying 66 by 5 to get 330; 330 divided by 9 is 36.66667, which is rounded up to 36.7.
- 23. c.** Each 9-foot wall has an area of 9×8 or 72 square feet. There are two such walls, so those two walls combined have an area of 72×2 or 144 square feet. Each 11-foot wall has an area of 11×8 or 88 square feet, and again there are two such walls: $88 \times 2 = 176$. To find the total surface area, add 144 and 176 to get 320 square feet.
- 24. b.** $1\frac{1}{2}$ cups equals $\frac{3}{2}$ cups. The ratio is 6 people to 4 people, which is equal to the ratio of x to $\frac{3}{2}$. By cross-multiplying, we get $6(\frac{3}{2})$ equals $4x$, or 9 equals $4x$. Dividing both sides by 4, we get $\frac{9}{4}$, or $2\frac{1}{4}$ cups.
- 25. c.** The distance between Fort Greenville and Fort Johnson is the hypotenuse of a right triangle with sides of length 90 and 120. The length of the hypotenuse equals the square root of the sum of the other two sides squared. $90^2 + 120^2 = \sqrt{22,500} = 150$ miles.
- 5. b.** To *elicit* means to *extract*.
- 6. d.** A *proclamation* is an *announcement*.
- 7. c.** Someone who is *pragmatic* is *sensible*.
- 8. c.** A *quandary* is a serious *problem*.
- 9. a.** An *opulent* person is a *wealthy* one.
- 10. c.** Someone who is *eloquent* is very *well spoken*.
- 11. e.** To have *fidelity* is to have great *loyalty*.
- 12. a.** *Limpid* means the same thing as *bright*.
- 13. b.** To *refute* an idea or statement means to *contest* its accuracy.
- 14. d.** When something or someone is *vulnerable*, that thing or person is *weak*.
- 15. a.** To perform a task in a *systematic* way is to do it in an *orderly* fashion.
- 16. a.** Someone with great *sagacity* possesses great *wisdom*.
- 17. c.** *Motley* means *multicolor*.
- 18. b.** To take a *jaunt* is to take a *trip*.
- 19. e.** To have *myriad* reasons for doing something is to have *many* reasons.
- 20. d.** To be in *unison* about an issue is to be in *harmony* about it.
- 21. e.** To possess *valor* is to possess *courage*.
- 22. c.** To be *blatant* is to be *obvious*.
- 23. a.** To *construe* means to *interpret*.
- 24. b.** Something that is *heinous* is *monstrous*.
- 25. d.** To do something with *gusto* is to do it with great *enthusiasm*.

Subtest 3: Word Knowledge

- 1. e.** To *preside* over a group or person is to *lead* that group or person.
- 2. a.** Something that is a *liability* is a *burden* to someone.
- 3. b.** Someone who is *diligent* is *hardworking*.
- 4. e.** To possess *agility* is to be able to move in a *quick, graceful* manner.

Subtest 4: Math Knowledge

- 1. b.** *PQ* and *RS* are intersecting lines. The fact that angle *POS* is a 90-degree angle means that *PQ* and *RS* are perpendicular, indicating that all the angles formed by their intersection, including *ROQ*, measure 90 degrees.
- 2. a.** Incorrect answers include adding both the numerator and the denominator and not converting fifths to tenths properly.
- 3. e.** To convert a fraction to a decimal, divide the numerator, 3, by the denominator, 4. $3 \div 4 = 0.75$.

- 4. b.** The correct answer is $88\frac{1}{3}$.
- 5. d.** Divide the numerator by the denominator: $1 \div 6 = 0.166667$. Round the answer to the thousandths place (three decimal places) to get the answer 0.167.
- 6. d.** You have to convert all three fractions to twelfths before adding them.
- 7. c.** Choice **a** totals 22,436; choice **b** totals 2,346; choice **d** totals 206,306, and choice **e** totals 216,306.
- 8. a.** The first box is one greater than -5 ; the second is one greater than 0.
- 9. d.** $1\frac{1}{2}$ is a mixed number. To convert this into a decimal, first take the whole number (in this case, 1) and place it to the left of the decimal point. Then, take the fraction (in this case, $\frac{1}{2}$) and convert it to a decimal by dividing the numerator by the denominator, yielding .50.
- 10. a.** Raise the fraction $\frac{2}{3}$ to 54ths by multiplying both numerator and denominator by 6.
- 11. d.** $7(8)(2) = 112$.
- 12. d.** Divide 3 by 8 in order to convert the fraction into a decimal. $3 \div 8 = 0.375$.
- 13. c.** The meaning of 4^3 is 4 times itself 3 times.
- 14. a.** The total on the right is 35. On the left, you need an operation you can do on 5 to get 35. Multiplying by $(5 + 2)$ does the trick.
- 15. a.** Using 20 for C: $F = (\frac{2}{5} \times 20) + 32$. Therefore $F = 36 + 32$, or 68.
- 16. c.** $5(3)(8) = 120$; $120 \div 3 = 40$.
- 17. c.** $10(10)(10) = 1,000$; $1,000(7.25) = 7,250$.
- 18. b.** To solve this problem, you must first convert yards to inches. There are 36 inches in a yard; and $\frac{1}{3}$ of a yard is 12 inches; $36 \times 3 = 108 + 12 = 120$.
- 19. a.** Divide 3 by 5 to convert from a fraction into a decimal: $3 \div 5 = 0.60$.
- 20. a.** 0.97 multiplied by 100 is 97.
- 21. c.** The sum of the measure of the angles in a triangle is 180° ; $70^\circ + 30^\circ = 100^\circ$; $180^\circ - 100^\circ = 80^\circ$.

- 22. b.** Since the solution to the problem $x + 32 = 14$, $x = -18$. Choices **a**, **c**, and **d** are all too large to be correct.
- 23. c.** Use the formula $A = lw$. or $108 = l \times 6$. Since the area is the length \times the width of the rectangle, then *dividing* the area (108) by the width (6) will give you the length, 18 feet.
- 24. a.** 37.5% is the same as $\frac{37.5}{100}$. Multiply both the numerator and the denominator by 10 to move the decimal point, resulting in $\frac{375}{1,000}$. Next, factor both the numerator and denominator to find out how far you can reduce the fraction: $\frac{5 \times 5 \times 5 \times 3}{5 \times 5 \times 5 \times 8}$. If you cancel the three 5s that are in both the numerator and the denominator, you get $\frac{3}{8}$.
- 25. b.** In the decimal, 0.15, the 5 falls in the hundredths place (two places to the right of the decimal). To convert this to a fraction, the 15 is placed over 100. Reduce, which gives you $\frac{3}{20}$.

Subtest 5: Instrument Comprehension

QUESTION	ANSWER	HEADING	PITCH	ROLL
1.	B	270° west	up	left
2.	C	180° south	down	none
3.	A	270° west	down	right
4.	C	090° east	none	left
5.	A	270° west	up	right
6.	D	180° south	up	left
7.	B	090° east	up	none
8.	A	180° south	down	right
9.	C	270° west	none	none
10.	B	270° west	down	right
11.	A	135° southeast	down	left

12.	C	270° west	up	none
13.	B	260° west-southwest	down	left
14.	C	255° west-southwest	up	left
15.	A	090° east	up	left
16.	B	100° east-southeast	up	left
17.	D	360° north	none	right
18.	B	285° west-northwest	up	left
19.	B	045° northeast	up	left
20.	A	180° south	none	left

Subtest 6: Block Counting

1. a. Block 1 touches only the block directly below it.
2. c. Block 2 touches the two blocks below it and the one above it, as well as the one to the right.
3. b. Block 3 touches the blocks to the left and to the right of it, as well as block 2.
4. d. Block 4 touches the block below it and above it, as well as the block to the left and the block below block 1.
5. a. Block 5 touches the block above it and the one to its left.
6. c. Block 1 touches the blocks to its left and right, as well as block 5 and the blocks to the left and right of block 5.
7. e. Block 2 touches the block above it and the block to its left, as well as block 5 and block 3, as well as the block between them.
8. e. Block 3 touches the two blocks above it, the one to its right, block 4, and block 2.
9. a. Block 4 touches the block above it, the block to its right, and block 3.
10. e. Block 5 touches the two blocks below it, the blocks to its left and right, block 2, the blocks to the left and right of block 1, and block 1.
11. c. Block 1 touches the block below it, the three blocks to its left including block 5, and the two blocks to its right including block 2.
12. d. Block 2 touches the block to its left, block 1 and block 4, and the block between block 1 and block 4.
13. b. Block 3 touches the block to its right and the 4 blocks above it including block 5.
14. c. Block 4 touches the block above it, the block to its left, and the two blocks to its right including block 2.
15. d. Block 5 touches the two blocks to its left, block 1, the block under block 1, and the block to the right of block 3.
16. e. Block 1 touches the blocks to its left and right, the block above it, the block below block 2, the block above block 5, and block 5.
17. b. Block 2 touches the block to its left, and the blocks above and below it.
18. a. Block 3 touches the block above it, the block to its left, and block 5.
19. c. Block 4 touches the block above it, the block to its left, the block below block 2, the block above block 5, and block 5.
20. e. Block 5 touches the block to the left and right of block 1, block 1, block 4, and the two blocks above it including block 3.

Subtest 7: Table Reading

1. b. Finding the intersection of the -3 column with the 0 row yields an answer of 48.
2. e. Finding the intersection of the -1 column with the 1 row yields an answer of 76.
3. a. Finding the intersection of the -2 column with the 0 row yields an answer of 58.
4. d. Finding the intersection of the 1 column with the 2 row yields an answer of 93.

5. c. Finding the intersection of the -2 column with the 2 row yields an answer of 35.
6. b. Finding the intersection of the -3 column with the 0 row yields an answer of 73.
7. d. Finding the intersection of the -2 column with the 1 row yields an answer of 18.
8. a. Finding the intersection of the 1 column with the 1 row yields an answer of 48.
9. c. Finding the intersection of the 0 column with the 3 row yields an answer of 69.
10. b. Finding the intersection of the 2 column with the 0 row yields an answer of 67.
11. e. Finding the intersection of the -1 column with the 2 row yields an answer of 11.
12. c. Finding the intersection of the 3 column with the -1 row yields an answer of 30.
13. a. Finding the intersection of the -2 column with the 3 row yields an answer of 22.
14. a. Finding the intersection of the 0 column with the 0 row yields an answer of 88.
15. d. Finding the intersection of the 0 column with the 3 row yields an answer of 55.
16. d. Finding the intersection of the 1 column with the -3 row yields an answer of 24.
17. b. Finding the intersection of the 2 column with the 3 row yields an answer of 78.
18. b. Finding the intersection of the 2 column with the -2 row yields an answer of 60.
19. c. Finding the intersection of the 1 column with the 0 row yields an answer of 57.
20. d. Finding the intersection of the 0 column with the -2 row yields an answer of 86.
21. b. Finding the intersection of the 0 column with the 2 row yields an answer of 91.
22. a. Finding the intersection of the 1 column with the 1 row yields an answer of 47.
23. e. Finding the intersection of the -1 column with the -1 row yields an answer of 69.
24. e. Finding the intersection of the 3 column with the 2 row yields an answer of 65.
25. d. Finding the intersection of the -3 column with the -3 row yields an answer of 38.
26. e. Finding the intersection of the -3 column with the 3 row yields an answer of 44.
27. b. Finding the intersection of the 0 column with the 1 row yields an answer of 62.
28. a. Finding the intersection of the 2 column with the 0 row yields an answer of 17.
29. c. Finding the intersection of the 3 column with the 0 row yields an answer of 35.
30. c. Finding the intersection of the 3 column with the 1 row yields an answer of 46.
31. d. Finding the intersection of the -2 column with the -2 row yields an answer of 43.
32. c. Finding the intersection of the -2 column with the 3 row yields an answer of 87.
33. e. Finding the intersection of the 0 column with the -3 row yields an answer of 11.
34. a. Finding the intersection of the 1 column with the -3 row yields an answer of 12.
35. b. Finding the intersection of the 1 column with the 1 row yields an answer of 62.
36. c. Finding the intersection of the -3 column with the 0 row yields an answer of 83.
37. b. Finding the intersection of the 0 column with the 2 row yields an answer of 66.
38. b. Finding the intersection of the -2 column with the -1 row yields an answer of 32.
39. a. Finding the intersection of the 0 column with the -1 row yields an answer of 57.
40. a. Finding the intersection of the 1 column with the 3 row yields an answer of 43.

Subtest 8: Aviation Information

1. d. All the examples given are high lift devices that increase the effective wing area. This increases the distance air has to travel over and under the wing, creating a larger pressure differential, which will increase lift at lower airspeeds.

- 2. b.** As the outside air temperature drops, the movement of air molecules in the atmosphere slows down. This results in an increase in air density, resulting in a corresponding increase in aircraft performance because of the more dense atmospheric medium it will operate in.
- 3. c.** The longitudinal axis extends the length of the aircraft, from the nose directly aft through the tail. Any movement about this axis is called roll. The ailerons are located on the wings, and when deflected into the airstream they alter lift on that wing, causing it to drop, resulting in a rolling motion. The other answers involve aircraft control mechanisms that affect other aircraft movements.
- 4. c.** Class A airspace is that airspace from Flight Level (FL) 180 or 18,000 feet to FL 600 or 60,000. Pilots are required to change the altimeter setting from the local altimeter they have been using to 29.92. This ensures all aircraft flying in Class A airspace have the same altimeter setting and will have proper altitude separation.
- 5. b.** In aeronautics, potential energy is energy stored in an aircraft by virtue of its position in space. An aircraft at the top of a loop has significant potential energy that can be reclaimed by pointing the nose down and gaining speed. At the bottom of the loop, that potential energy is converted to kinetic energy, or energy that exists because of an object's motion.
- 6. a.** Runways are numbered by the compass heading they are aligned toward.
- 7. c.** Air becomes less dense with altitude and hot weather, significantly degrading aircraft performance. Therefore a high altitude airport on a hot day poses a takeoff or landing challenge for a pilot.
- 8. b.** Runway taxi lights are blue in color. Different colors are used to identify all airfield areas where aircraft must operate while on the ground.
- 9. d.** Lowering wing flaps will change the shape of the wing, which increases lift. This increased wing area resulting from lowered flaps, however, will also increase drag.
- 10. b.** Boundary layer airflow is the thin layer of air that passes directly along the surface of a wing or an airfoil. Its thickness is measured in molecules. Smooth boundary layer air is known as laminar flow, while boundary layer air that becomes less smooth and stable as it moves along the larger upper surface of a wing or airfoil becomes thicker and eventually detached from the surface and is then known as turbulent flow.
- 11. a.** If your cockpit turn and bank indicator shows a perfectly centered ball, all aerodynamic parameters of the aircraft are in balance.
- 12. d.** Spoilers are small control surfaces on the wings. When deployed, or raised into an *up* position, they disrupt the boundary layer airflow over the wing which decreases lift on that wing and increases drag.
- 13. c.** The transponder, also called an *identification, friend or foe* (IFF) device in the military, can provide a wide variety of aircraft information to a ground unit or to another airborne unit.
- 14. c.** A headwind during takeoff would provide your aircraft with more wind over your wings, increasing lift earlier in your takeoff roll, resulting in a shorter takeoff distance. Likewise, this increased lift during takeoff would translate into an increased climb angle to the increased efficiency of a headwind takeoff.

- 15. c.** VSI stands for *vertical speed indicator* and measures aircraft speed in feet per minute during a climb or a descent.
- 16. d.** The vertical speed indicator measures how fast you are climbing in altitude (rate of climb), how fast you are descending in altitude (rate of descent), or whether you are in level flight (zero rate of climb or descent).
- 17. a.** Remember that runways are numbered based on a two-digit abbreviation of their compass headings, so when one end of a runway is numbered 33 (based on a 330 heading), the opposite end will be 18 degrees (or 180 degrees) opposite, or 15 (based on a 150 heading).
- 18. c.** Ground speed (GS) is the actual speed of the aircraft over the ground. The GS component is not affected by air density, temperature, or any atmospheric effect other than wind, which will physically slow down the aircraft with a headwind or speed up the aircraft with a tailwind, affecting the aircraft's physical speed over the ground.
- 19. a.** While there are many components that make up drag, total drag can be classified as either parasite or induced. Parasite drag is the result of the skin friction, roughness, and pressure drag of the major components of the aircraft. Induced drag is that aerodynamic effect that results from the development and production of lift. For example, lowering wing flaps would result in an increase in induced drag since there is more wing area in the relative wind.
- 20. c.** Bernoulli's Principle uses the laws of physics to demonstrate how an aircraft wing produces lift. The curvature of the upper portion of a wing creates a larger area for air to pass over, resulting in an increase in the speed of the airflow, and thereby decreasing pressure. The bottom portion of a wing is not curved at all or as much, resulting in the air passing over at a slower rate, increasing pressure. A moving body will always move in the direction of lower pressure, resulting in lift on an airfoil or wing.

Subtest 9: General Science

- 1. c.** An element's number of protons determines its location on the periodic table. For instance, hydrogen (H) has one proton, helium (He) has two protons, and lithium (Li) has three protons, so H, He, and Li are numbers 1, 2, and 3 on the periodic table.
- 2. b.** Isotopes are atoms of the same element with varying atomic masses depending on how many neutrons are in the nucleus.
- 3. c.** Marine biology is the study of the plants, animals, and microbes found under water and is a branch of the larger encompassing field of oceanography.
- 4. d.** A single molecule of any substance must contain the same elements in the same proportions as a larger amount of that substance. Therefore, a molecule of carbon dioxide (CO₂) must have 1 carbon atom and 2 oxygen atoms.
- 5. c.** The concept of centrifugal force suggests that the mass of an object will be pushed in an outward direction when it is spinning in a circular motion. Fundamental forces usually refer to forces between elementary particles such as electromagnetism or gravity. The Coriolis effect is caused by the rotation of the Earth on its axis.

- 6. e.** The food coloring spreading out into the water is an example of diffusion, which is the spreading out of the molecules of a substance from places of greater molecular concentration to places of lower concentration.
- 7. c.** Cooking a hamburger involves a chemical change. The other choices involve physical changes.
- 8. a.** Carbohydrates are digested more easily and absorbed more quickly than fats. Choice **b** is incorrect because amino acids are the building blocks of proteins. Choices **c** and **d** are not true of carbohydrates.
- 9. d.** The troposphere is closest to the Earth's surface, then the stratosphere, the mesosphere, and finally the thermosphere. There is no such thing as the necrosphere.
- 10. e.** Reptiles lay their eggs on land, so they do not have internal development of eggs.
- 11. d.** The snake is the only vertebrate—that is, it is the only one of the four animals that has a backbone.
- 12. b.** A single organism may acclimate itself to the stresses associated with a new environment. Evolution and the process of natural selection occur over several generations.
- 13. e.** Omnivores eat many types of food, including plants and flesh.
- 14. b.** The electromagnetic spectrum contains these wavelengths, from shortest to longest: gamma rays, x-rays, ultraviolet, visible, infrared, microwave, radio.
- 15. d.** Gravity is the weakest of the four fundamental forces. Gravity controls the movement of planets, stars, and galaxies, as well as holding objects on Earth.
- 16. a.** The Sun is a star in the center of the solar system; it is almost 110 times the diameter of the Earth. Venus is slightly smaller than the Earth. Jupiter is the largest planet in the Solar System (with a diameter 11 times that of the Earth), but it only contains 0.1 percent of a solar mass.
- 17. e.** Absolute zero, when all atoms in solid matter stop vibrating, is -273° Celsius or 0° Kelvin.
- 18. a.** Our solar system contains eight planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, and Neptune.
- 19. b.** Only a plant or algae cell contains chloroplasts, the site of photosynthesis in plants and algae. Therefore, fern (a plant) is the only possible answer.
- 20. a.** Deoxyribonucleic acid (DNA), the genetic blueprint of cells, is located in the nucleus of animal cells.

Subtest 10: Rotated Blocks

- 1. b.**
2. d.
3. e.
4. c.
5. c.
6. a.
7. c.
8. b.
9. c.
10. e.
11. e.
12. a.
13. b.
14. a.
15. c.

Subtest 11: Hidden Figures

- 1. c
- 2. b
- 3. a
- 4. d
- 5. e
- 6. a
- 7. b
- 8. d

- 9. e
- 10. c
- 11. c
- 12. d
- 13. b
- 14. a
- 15. e

For information on how the official AFOQT is scored, see Chapter 3.