Answer Key

Directed Reading A

SECTION: MEASURING MOTION

1. Answers may vary. Sample answer: I cannot see Earth moving; yet I know it moves (revolves) around the sun.
2. A
3. D
4. reference point
5. They make useful reference points because they do not move.
6. Answers may vary. Sample answer: Yes, a moving object can be used as a reference point because it can be observed in relation to another moving object.
7. time
8. m/s, or meters per second
9. Answers may vary. Sample answer: Objects don't often travel at a constant speed.
10. Average speed is the total distance traveled divided by the total time taken to travel that distance.
11. The distances vary, because the speed is not constant.
12. The line representing actual speed per hour will usually not be straight, because speed usually changes. The line representing average speed over the entire time will be straight, as it represents average speed as if it were the same speed all the time.
13. They are traveling in different directions.
14. Velocity includes direction; speed does not include direction.
15. Add the velocities together.
16. Subtract the smaller velocity from the larger velocity. The resultant velocity is in the direction of the larger velocity.
17. Yes, a change in direction is acceleration, just as a change in speed is acceleration.
18. positive
19. negative acceleration; deceleration
20. average acceleration = (final velocity starting velocity)/time it takes to change velocity
21. A change in velocity means acceleration. The cyclist's velocity increased from 1 m/s south to 3 m/s south. So, the cyclist is accelerating.
22. A graph would show velocity changing as time passes.
23. Answers may vary. Sample answer: The graph's upward (positive) slope represents increasing velocity, which is what the roller coaster has as it travels downward.
24. Yes, it is always accelerating while it remains in a circle, because it is always changing direction.

SECTION: WHAT IS A FORCE?

1. force
2. force
3. newton
4. object
5. Answers may vary. Sample answer: I exert a force on a book when I pull it open; I exert a force when I push the buttons of a computer keyboard.
6. Answers may vary. Sample answer: When I sit on a chair, the force I exert on the chair does not make it move.
7. Answers may vary. Sample answer: The force that pulls magnets to refrigerators cannot be seen.
8. Answers may vary. Sample answer: The air held to Earth's surface by gravity cannot be seen.
9. net force
10. When both students apply force in the same direction, their forces are added together to determine a net force.
11. The dog on the left will win the tug-of-war, because the net force will be 2 N to the right.
12. whether the forces on the object are balanced or unbalanced
13. when the net force is 0 N
14. 0 N
15. You need an unbalanced force.
16. A soccer ball that has been kicked continues to roll on the ground long after the ball is kicked.

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