Acceleration Story Problems
Integrated Science: Physics/Design

Name: _____ Per. ___

1. While traveling along a highway, a driver slows from 24 m/s to 15 m/s in 12 seconds. What is the automobile's acceleration? (Remember that a negative value indicates a slowing down or deceleration.)

$$a = \frac{v_f - v_i}{t} = \frac{15\ m/s - 24\ m/s}{12\ s} = \frac{-9\ m/s}{12\ s} = -0.75\ m/s/s \quad m/s^2$$

2. A parachute on a racing dragster opens and changes the speed of the car from 85 m/s to 45 m/s in a period of 4.5 seconds. What is the acceleration of the dragster?

$$a = \frac{v_f - v_i}{t} = \frac{45\ m/s - 85\ m/s}{4.5\ sec} = \frac{-40\ m/s}{4.5\ s} = -8.9\ m/s^2 \quad m/s/s$$

3. A helicopter's speed increases from 25 m/s to 60 m/s in 5 seconds. What is the acceleration of this helicopter?

$$a = \frac{v_f - v_i}{t} = \frac{60\ m/s - 25\ m/s}{5\ s} = \frac{35\ m/s}{5\ s} = 7\ m/s^2 \quad m/s/s$$

4. As she climbs a hill, a cyclist slows down from 25 m/s to 6 m/s in 10 seconds. What is her deceleration? *(Be sure your answer has the correct number of significant digits.)*

$$a = \frac{v_f - v_i}{t} = \frac{6\ m/s - 25\ m/s}{10\ s} = \frac{-19\ m/s}{10\ s} = -2\ m/s^2 \quad m/s/s$$

5. A runner goes from 2.0 m/s to 10. m/s. in 6.0 seconds. What is the runner's acceleration? *(Be sure your answer has the correct number of significant digits.)*

$$a = \frac{v_f - v_i}{t} = \frac{10.\ m/s - 2.0\ m/s}{6.0\ s} = \frac{8.0\ m/s}{6.0\ m/s} = 1.3\ m/s^2 \quad m/s/s$$

6. A skateboarder traveling at 7.0 meters per second rolls to a stop at the top of a ramp in 3.0 seconds. What is the skateboarder's acceleration?

$$a = \frac{v_f - v_i}{t} = \frac{0\ m/s - 7.0\ m/s}{3.0\ sec.} = \frac{-7.0\ m/s}{3.0\ s} = -2.3\ m/s^2 \quad m/s/s$$