

Motion Worksheet #9 Key

1. Mass is inertia; momentum is inertia in motion.
2. The truck has the greater mass; the skateboard has the greater momentum.
3. Impact designates a force; impulse = force x time.
4. Increases.
5. Impulse = force x time; momentum is inertia in motion.
6. Change in momentum.
7. The impulse doubles; the change in momentum doubles.
8. Greater time means less force.
9. It is reduced to one fourth.
10. Greater time means less force; less time means greater force.
11. $16 \text{ kg} \cdot \text{m/s}$
12. 32 N
13. $200 \text{ kg} \cdot \text{m/s}$
14. 66.6 N
15. $25 \text{ N} \cdot \text{s}$; $25 \text{ kg} \cdot \text{m/s}$
16. So the reaction force of the handlebars on you will produce a backward-acting impulse to bring your momentum to zero.
17. Air bags increase your stopping time in a head-on collision. Greater time of impact means less impact force.
18. The hose tends to recoil from the ejected water.
19. The time it takes to stop is extended as the sheet sags. More time means less impact force, and an egg that is less likely to break.
20. The spring exerts a greater impulse because it produces a bigger change in the ball's momentum.