

Motion Worksheet #6 Key

1. Natural motion is straight up or down. Violent motion is imposed.
2. It slows motion.
3. No change (ignoring friction and air resistance).
4. To the same height if there is no friction.
5. Both. (Examples will vary.)
6. To overcome friction.
7. None.
8. Yes; yes; yes.
9. Yes; no.
10. Mass is the same in all locations, while weight depends on the local gravity.
11. 19.6 N
12. 490 N
13. 19 600 N
14. When struck from behind, the car accelerates forward rapidly. The tendency of the passenger (body and head) is to remain moving with a constant velocity. The seat of the car causes the body to accelerate forward along with the car. The head, however, stays where it is (seeming to whip back). This causes an injury known as whiplash. Headrests work to keep the body and head moving together when the car is accelerated forward.
15. (a) Except for some change in motion due to friction, there will be no relative motion of the ball relative to the ground. (b) Relative to the wagon, the ball will move toward the back. (In reality, the wagon is moving forward while the ball remains stationary. This creates the appearance of the ball moving backward.)
16. No; yes; no. It has the same amount of matter before and after being crushed.
17. Because of its large mass, the elephant would have difficulty zigzagging. (Its large inertia means it would have trouble changing its state of motion.)