

Acceleration

1. A child drops a ball from a bridge. The ball strikes the water under the bridge 2.0 seconds later. What is the velocity of the ball when it strikes the water? (Hint: the acceleration of gravity is constant at 9.8 m/s^2 .)
2. A freight train traveling with a speed of 18.0 m/s begins braking as it approaches a train yard. The train's acceleration while braking is -0.33 m/s^2 . What is the train's speed after 23 s?
3. In 1970, Don "Big Daddy" Garlits set what was then the world record for drag racing. He started at rest and accelerated at 16.5 m/s^2 (about 1.68 times free-fall acceleration) for 6.5 s. What was Garlits's final speed?
4. A child sleds down a steep, snow-covered hill with an acceleration of 2.82 m/s^2 . If her initial speed is 0.0 m/s , and her final speed is 15.5 m/s , how long does it take her to travel from the top of the hill to the bottom?
5. A fighter jet landing on an aircraft carrier's flight deck that has a length of 300.0 m must reduce its speed from about 153 km/h to exactly 0 km/h in 2.0 s. What is the jet's acceleration?