Phet simulation Activity Answer Key

You will likely notice that adding more mass to the skateboard decreases the acceleration, and removing mass likewise increases the acceleration. Similarly, adding more force should increase the acceleration that you observe and vice versa. These phenomena are both due to Newton's second law: F = ma, and thus all observations should line up with this formula.

Challenge Question: You can solve the mass of the unknown box using Newton's second law. With an applied force of 50N, the present took 10s to go from 0 to 10 m/s. This is equivalent to a force of 50N and an acceleration of 1 m/s^2. Plugging into F = ma, we get m = F/a = 50/1 = 50kg. Thus, the mystery box has a mass of around 50 kg. Any answer near this result is acceptable, as the measuring tools are not exact.