Introduction

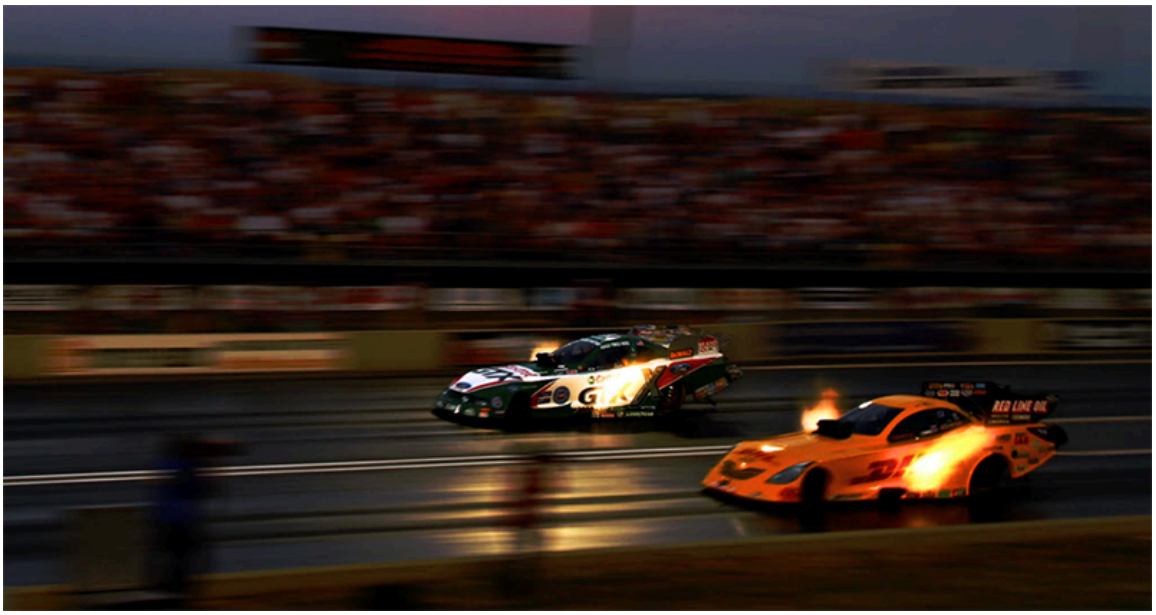

Figure 3.1 This exciting image shows two drag racers moving at large speeds at Denver's Mopar Mile High NHRA National drag races in July 2010. (Image Credit: Zach Dischner, Wikimedia Commons)

Our universe is full of objects in motion, from galaxies and planets to cars and people, down to molecules and atoms. In our initial study of physics, we'll explore the motion of (mostly) common objects using "kinematics" and "dynamics." Kinematics, the topic of the next two chapters, describes motion without considering its causes. Kinematics involves several parameters for the motion of objects, including: position, time, velocity, and acceleration. We'll explore causes of motion, dynamics, in the chapters on Newton's Laws, Energy, and Momentum.

In this chapter, we will start the study of kinematics by considering the motion of objects moving along a straight line, such as an apple falling from a tree or a drag race such as is shown above. As the cars race along the horizontal track their displacements (changes in position), velocities (the rate the displacements change with time), and accelerations (the rate the velocities change with time) all determine the winner of the race. These one dimensional examples will illustrate the relations that describe motion of objects and develop the skills needed to solve for this motion. These skills will be applied to motion in two and three dimensions, the topic of the next chapter.

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