

Frames of reference, laws of motion, forces and resulting motions

This chapter will help us understand the most important forces in the field of meteorology and how they are linked to the weather as observed on daily basis. Some of the forces are directly linked to the weather while others are more linked with the atmospheric particle matter motions that may not necessarily be visible to the naked eye.

Whether or not an object is referred to be in motion depends on the reference point. Think of a situation where you are sitting in a car/plane. Relative to the car/plane you are not moving as you sit on the seat. However, relative to the ground, you are moving at the speed of that car/plane. So whether or not you are moving is determined by the reference point (commonly referred to as the frames of reference).

It is important to note that being in motion means you are covering some distance over time. Sometimes you can have your feet in motion but no distance being covered because your reference point is also in motion. This most often happens when you are moving against an elevator or running against a treadmill. In that case it means you are moving even though you are not covering any distance relative to a stationary reference point, the result is that you are ultimately moving at the resultant speed/velocity of zero. Bear in mind that in this course being in motion also accounts for moving at zero resultant velocity.

We also go on to look at the newtons laws of motion and their applications to the atmospheric science. It is in this context that we will also study scalar quantities and vector quantities because they play a very big role in the motions that we see within the atmosphere. To end this chapter, we will consider some typical motions, their impacts as a result of the different forces and laws that govern motions in general, we will also learn about the magnetic field and the force associated with it.