Chris Oehrlein* (cdoehrlein@gmail.com) and Jessica Oehrlein. First and Second-Order Models of Vertical Motion of Dry Air Parcels.

Using basic thermodynamic principles as the foundation, Atmospheric Physics contains many relationships that Introductory Differential Equations students can model. Assuming no exchange of heat as a dry air parcel rises leads to a separable equation relating the parcel’s temperature to its pressure. Comparing the atmosphere’s natural change in temperature due to altitude to a dry air parcel’s same rate of change leads to a second order linear equation modeling the change in vertical position of the air parcel. Collaborating with a graduate student in Applied Math and Atmospheric Science, a differential equations instructor now has a couple of homework problems that are very unique when compared with applications in standard Differential Equations textbooks. (Received September 25, 2017)