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Article Abstrct: We describe an easy and fun project using water rockets to demonstrate applications of single variable calculus concepts. We provide procedures and a supplies list for launching and videotaping a water rocket flight to provide the experimental data. Because of factors such as fuel expulsion and wind effects, the water rocket does not follow the parabolic model of a textbook projectile , so instead we develop a one-variable height vs. time polynomial model by interpolating observed data points. We then analyze this model using methods suitable to a first semester calculus course. We include a list of questions and partial solutions for our project in which students use calculus techniques to find quantities not apparent from direct observation. We also include a list of websites and other resources to complement and extend this project.

While this piece specifically does NOT use differential equations it is about how one could collect data to use in a differential equation model for projectile motion. Moreover, there are several excellent references.