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Using the science of granular materials to engage middle and high school students in the process of scientific enquiry[1] JENNIFER PODEL, NALINI EASWAR, Smith College, Northampton, MA, SHUBHA TEWARI, KARL MARTINI, Western New England University, Springfield, MA, KRISTIN DOLCI-MASCOLO, Amherst Regional Middle School, Amherst, MA, ERIC NEWMAN, Northampton High School, Northampton, MA — We describe outreach efforts that use the science of granular materials to engage middle and high school physics students in local public schools in scientific investigations. In the middle school, the students were provided with a set of questions, and starting materials to set up their experiments. Examples of investigations pursued by the students include looking at the influence of the size and shape of grains on (i) their rate of flow through a hopper and (ii) their tendency to desegregate in a flow. The high school students were introduced to the properties of granular materials via a series of activities that explored the complex behavior of these materials. Following this, groups of students were challenged to pose a question and design an experiment to investigate a particular aspect of the properties of granular materials. Examples of questions that the students chose to investigate include: How does the shape of grains influence how well they stack in a pile? What factors affect the probability of avalanches down an incline? Both sets of students worked in groups over a period of two months to take quantitative data to test their hypotheses. The investigations culminated in a set of presentations by the students to local faculty and students.

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