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(Un)productive Engagement with Problems in the Lab¹ ANNA PHILLIPS, MEAGAN SUNDSTROM, DAVID WU, NATASHA HOLMES, Cornell University — With the adoption of instructional laboratories (labs) that require students to design and implement their own experiments, there is a need for additional research examining students' engagement in these labs. In this talk, we present summaries of the trajectories of seven groups of students in a single lab session. The students were prompted to predict and investigate the acceleration of multiple objects in flight, including beach balls and basketballs. The beach balls were intentionally included to prompt a conflict, as students were asked to predict the acceleration of the ball considering models including gravity or gravity and drag and the buoyant force on the beach ball causes unexpectedly low accelerations. We describe the differences and similarities between the groups that engaged productively with this conflict and those that did not. How students *frame* the activity—that is, what their expectations are for what is taking place—differs between those that engage productively in the problem and those that do not.

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