

Bungee jump activity rubric.

A teacher may choose to ask students to use a graphical analysis approach, an algebraic analysis approach, or both or permit students to devise their own analysis approach and accept either.

Criteria	Particularly well done (3 points)	Adequate (2 points)	Improvement needed (1 point)
Science laboratory processes	<p>Student paid careful attention to all aspects of good laboratory work, such as</p> <ul style="list-style-type: none">• consistency of drop procedures;• use of consistent procedures in multiple trials;• observation such as avoiding parallax; and• screening for consistent rubber bands.	<p>Student paid attention to most laboratory processes that helped ensure quality data collection. One or two instances or oversights may degrade data quality.</p>	<p>Student failed to pay attention to most aspects of good laboratory techniques, generally resulting in poor data quality.</p>
Documenting outcomes	<p>Student provided clear, well-organized, complete documentation of outcomes, such as</p> <ul style="list-style-type: none">• organized data tables with appropriate column or row labels;• appropriate units;• provisions for systematic documentation of repeated trials, including combining them into one data value; and• adequate text for an outside reader to understand the context and purpose of the data table(s).	<p>Student recorded outcomes so that the reader, perhaps sometimes with additional verbal guidance from his or her peers, can understand the nature and purpose of the data.</p>	<p>Student recorded outcomes in a haphazard or ill-structured manner, making it difficult to understand what the data are and where they originated and to follow the organizational logic of the material.</p>

Graphical analysis approach	Graph is useful for direct analysis to answer questions. Graph is well constructed (i.e., labeled and appropriately scaled axes with units, title, data correctly graphed, best-fit lines). Graph generates an evidence-based response to the overall challenge of determining the appropriate bungee length for an egg to get close to the floor without touching.	Graph has correct data but is incomplete (e.g., no labels, units, extrapolation line). With a small amount of assistance, students can use it to determine an answer to the overall test.	Graph is not useful for analysis (e.g., incorrectly constructed, incorrect data).
Algebraic analysis approach	Student appropriately used data in an algebraic-like manner to generate a response to the overall challenge of determining bungee length. For example, student might include an extended data chart based on patterns noticed or computation of algebraic equation of best-fit line and use that equation to compute the final result.	Student appropriately used aspects of algebraic analysis—such as noticing a pattern in the data set per rubber band and, perhaps somewhat haphazardly, using that to iteratively come to a final result.	Student analysis is not helpful for arriving at a useful response to the final result.
Final test	Student used his or her answer for a final test of the bungee jump and came appropriately close to the calculated value (i.e., within 10 cm). Student then used this test result (perhaps iterated several times for reliability of data) and tweaked the final answer for a second attempt at the final bungee jump, resulting in an improvement.	Student used his or her answer to guide a final test of the bungee jump but chose to arbitrarily add or subtract a rubber band. Student perhaps failed to make sure he or she selected all identical rubber bands for the final test and didn't use these additional data as effectively as possible for a final tweak and retest.	Student was unable to use his or her data or make a connection between data and computations and arrive at a result. Final test bungee cord seems to be generated independently of any data collection or analysis.