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| Water Bottle Challenge |  |
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|  What makes a good flip?Your task is to design a series of investigations to help you determine the best conditions when flipping and landing a tossed plastic bottle. The variables you can test are endless! Sample tests could include:* How does the amount of liquid in the bottle impact landing rates?
* Does the type of liquid (viscosity) alter the chance of success?
* Would using sand or sugar instead of water help your chances?
* To what degree does the bottle size/shape help boost your odds?
* Does the landing surface alter your chances of sticking the landing?
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**Guidelines**

When designing your investigations, keep the following guidelines in mind:

* A successful land occurs when the bottle lands vertically after at least one spin in the air.
* Your group may test as many variables as you want given that you are able to complete the accompanying inquiry report before the due date of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
	+ You will use your Microsoft 365 accounts to collaboratively construct a final lab report to outline your findings and share your results.
		- Make sure to “share” your paper with Mr. Shafer as an editor
			* Aaron.shafer@beavercreek.k12.oh.us
* Your paper needs to defend the question of “**what conditions make for the perfect flip**?” and include the sections and headings described below.
	+ **Introduction:** The beginning of your paper should introduce your investigation
	+ **Hypotheses:** For all of your tested variables, your group should provide a hypothesis
	+ **Procedure:** A detailed description of the tested variables and methods your group used should be presented.
		- An explanation of how your group was able to control your experiments to the best of your ability should be included as well.
	+ **Data:** Data tables, graphs, and statistical analysis (mean, median, and mode) should be abundant throughout your paper.
		- This section should simply be your findings and data—no conclusions yet!
	+ **Conclusion:** After the data has been presented, your paper should also include a conclusion where your group addresses the following:
		- Were your hypotheses supported or rejected based on the data you collected? Explain using your data tables and graphs.
		- Provide a detailed and thorough discussion of your collected data to show what conditions provide the best outcomes for bottle flippers.
			* This section needs to use the collected data (refer to tables and graphs) as evidence
	+ **Reflection:** Finally, your paper should include a detailed reflection where your group responds to the following:
		- How reliable is the data you collected? Explain.
			* What are possible sources of error?
		- What did your group do well? If you had the chance to redo this investigation, what would your group do differently?
		- What did you learn from this lab? What will you take away?
* At the conclusion of the lab, a final showdown will occur. This “battle of the bottles” will be the ultimate test where your group has a chance to rise to the top of the bottle flipping world.
	+ Each group will get 25 flips with their ideal bottle conditions.
		- **The group that is able to land the highest number of flips will be crowned champion!**