Name: _____

Water-bottle rocket Design Challenge

1. **Problem** - Create a water-bottle rocket that stays in the air the longest. You will create your own fins and nose cone on the 3d.
   a. Criteria/constraints:
      - must have 3 or 4 fins that you design/create
      - must have a nose cone to house the parachute
      - parachute must deploy and return the rocket to the ground

2. **Brainstorm** - use complete sentences to answer the following:
   Draw your basic design sketch of the fins, nose cone, and how the parachute will deploy

3. **Research** - Explain the reasons for the designs of your fins and nose cone. Why did you choose the shapes you did? What are the shapes you chose good for?
   Define: thrust, gravity, rifling, inertia, and explain what they each have to do with this project

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4. **Develop multiple ideas** - discuss w/partner, then in a short paragraph, explain what you like about each person's idea and why.
5. **Choose best idea** - design matrix and explain whose idea you are using and why, show final drawing and dimensions of design you are going to make.

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6. **Model** - build physical model

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7. **Test / Evaluate** - explain if it will work or not ... include a picture
8. **Improve design** - explain how you could make it better ... or make it better if there is time and your product is small enough to print again easily

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9. **Communicate results** - Show the class your idea. Explain what it does and show how it works

Score	Rubric Details
A = 27 - 30	All instructions followed and questions answered with complete sentences and details
B = 24 - 26	Most instructions followed and questions answered with complete sentences
C = 21 - 23	Several instructions not followed or missing and incomplete sentences
D = 18 - 20	Missing a lot of instructions, questions not answered
F = 15	Did not follow directions at all