Name:_____ Date:_____ Grade: _____/300 points

Grocery Bag Rope: Engineering Design Brief

Challenge: To create a 6-foot length of rope made entirely from plastic grocery/shopping bags. The rope will be connected to a 5-gallon bucket that will be filled with weight. Your rope must be strong enough to lift the bucket one foot off the ground and hold it for 5 seconds.

Restraints: You may only use plastic shopping bags. You may chose grocery bags or thicker plastic shopping bags. You may use as many bags as you wish, but you will provide said bags.

Instructions: **1. Research & Design** (100 points)

Research: A. List one website you used that you learned about rope making.

_____

B. Brainstorm and draw thumbnail sketches of possible ideas on the back of this sheet.

C. Then list IN DETAIL (50+ words) how you plan to build the tower.

D. Include labels of the measurements of each part.

2. Testing (200 points)

Grade	A	B	C	D	F
Requirements	Your rope holds **50 lbs. or more** in the bucket.	Your rope holds **40-49 lbs**. in the bucket.	Your rope holds **30-39 lbs**. in the bucket.	Your rope holds **20-29 lbs**. in the bucket.	Your rope holds **19 lbs. or less** in the bucket.

3. Review questions: (20 points each. Write in complete sentences!) (100 points for making a rope)

1. How much weight did you predict your rope would hold? How much weight did your rope hold?

2. Does your rope look like your original design? If not, what did you change? Explain.

3. Which rope won the contest? Why did their rope do better than yours? What was different?

4. Hypothetically, if you made a "perfect" rope. What is the maximum weight it could hold? Explain.

5. If you were to do this challenge again, what would you do differently? Be specific.