Name: _____

Plastic bridge - Design Challenge

1. **Define the Problem** - Build a plastic bridge using straws and tape that will support the most "cars" for the least cost before collapsing.
   a. Criteria/constraints - must span a 30cm gap and able to be moved as a unit:
      - straws cost $1 each and may be cut or bent (maximum of 50 straws)
      - tape costs $5 per foot
      - design should resemble a real bridge (not just straws taped together)
2. **Brainstorm** - Use complete sentences to explain the basic structure of your design
      1. Draw/sketch/dimension YOUR ideas

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3. **Research** - Discuss *tensile strength* and *compressive strength*. Sketch the 6 basic bridge structures and label the tension (tensile strength) and compression.
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 your bridge and include a picture in the notebook
7. **Test / Evaluate** - explain if it worked or not.
8. **Improve design** - how could you improve your design?

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9. **Communicate results** - Create a slide show to present to the class
   - Slide 1 - title, names, picture of all partners
   - Slide 2 - define problem, picture
   - Slide 3 - list criteria/constraints, picture
   - Slide 4 - picture of sketches
   - Slide 5 - design matrix, final sketch
   - Slide 6 - Picture of bridge
   - Slide 7 - evaluation (how well did it work)
   - Slide 8 - how could you improve design

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