Leaning Tower of Pasta

Name: _____

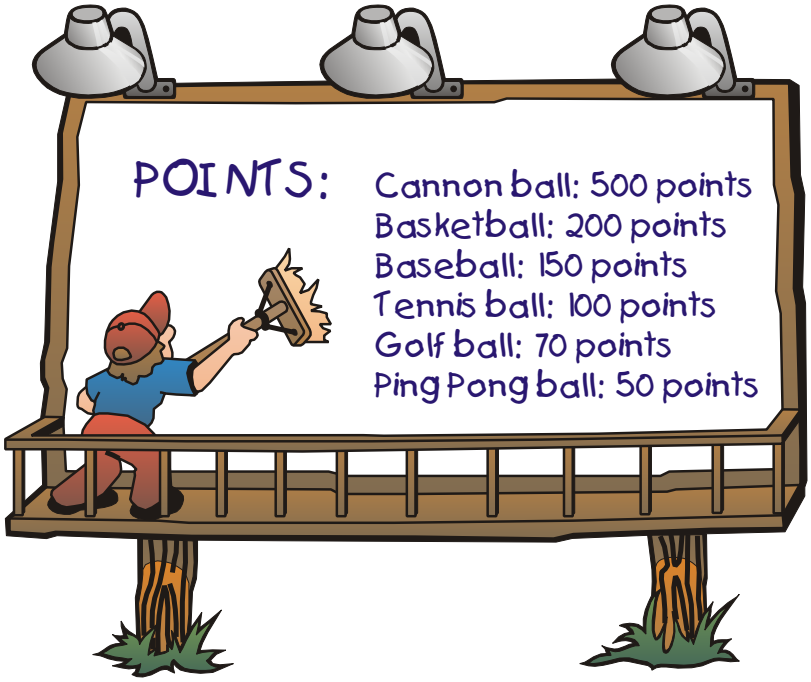
Canada is home to the tallest free-standing tower in the world: the CN Tower. You probably won't be able to match its 533 meters, but let's see just how sky-high and strong you can get your structure. The object is to make the strongest but most efficient tower you can. You must first do a little research to determine how to design towers and what makes them strong. You also must define all of the vocabulary before you can begin

Materials

- spaghetti (uncooked!)
- marshmallows (small)
- measuring tape
- all kinds of balls

Instructions

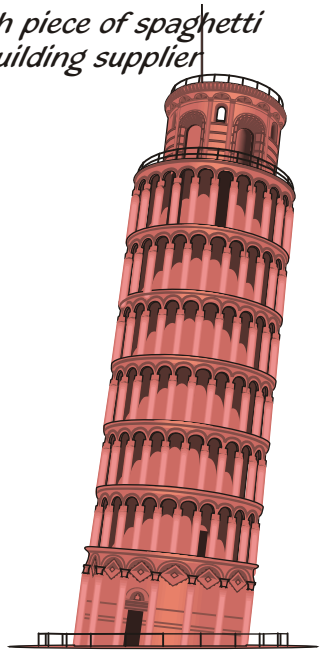
Psych! There are no step-by-step instructions for this project! You can do whatever you want with the materials. The object is to build a tower as high and as strong as you can using only spaghetti and marshmallows. How much weight will your tower support? Will it hold a ping-pong ball? A golf ball? A tennis ball? A basketball? A cannon ball? Give yourself points as follows:



- *Give your team 100 points for every inch high your tower is.*
- *Give your team an extra 500 points if you finished your tower before you ate all the marshmallows.*
- *Give your team 500 extra points if your tower is "funky" looking (we'll have to judge this one).*
- *Give your team 1000 extra points if you have the tallest tower in the class.*
- *Give your team 1000 extra points if you use the least amount of marshmallows for your tower.*
- *Subtract 200 points for each trip you have to make back to the building supplier.*
- *Subtract 50 points for each piece of spaghetti you have to return to the building supplier*

HINTS:

- *Experiment with your materials. Are marshmallows stronger in tension or in compression? What about spaghetti? Is it better to use a whole piece of spaghetti or many small pieces?*
- *Try to complete as much of your tower in one class period as you can. The marshmallows will harded after they are stored for a few days.*
- *Make sure you design and make the top of the tower strong enough and big enough to support all of the balls listed.*
- *Try not to eat all of your marshmallows!*



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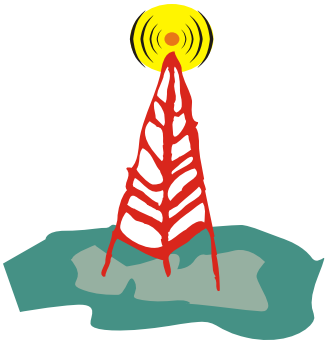

Researching the design problem is half the fun, but don't wander too far off track. Time is limited, so let's get as much info as we can quickly and accurately.

Directions

Use the internet to research the fundamentals behind tower structure. Specifically look for towers that are made out of many thin beams or cross members. (REMEMBER, you are only using the materials listed) Try and jot down as many ideas and notes as you can. We are only using one class period for the research part of this activity.

Design Ideas

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Notes:

Vocabulary Words:

Tensile Stress:

Compression Stress:

Shear Stress:

Torsion Stress:

Materials:

Projected Number of members needed: X $200 =

Projected number of connectors needed: X $30 =

Total Projected Construction costs for materials:

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Final Design Idea

By now you should have a pretty good understanding of how towers are constructed. It is time for your team to come up with a final tower design that you will build. Be sure to review your research and compare notes and drawings. Remember, the more ideas you have the more creative your design should be. Good Luck!