

Name:

Period:

Paper Crush

Problem Identification:

Problem Statement:

You need to design, construct, and test a structure that will hold 200 lbs of pressure. The structure must be 3" wide, 3" deep, and 2" tall, and be constructed from ONLY a sheet of computer paper and 6" of masking tape.

Constraints:

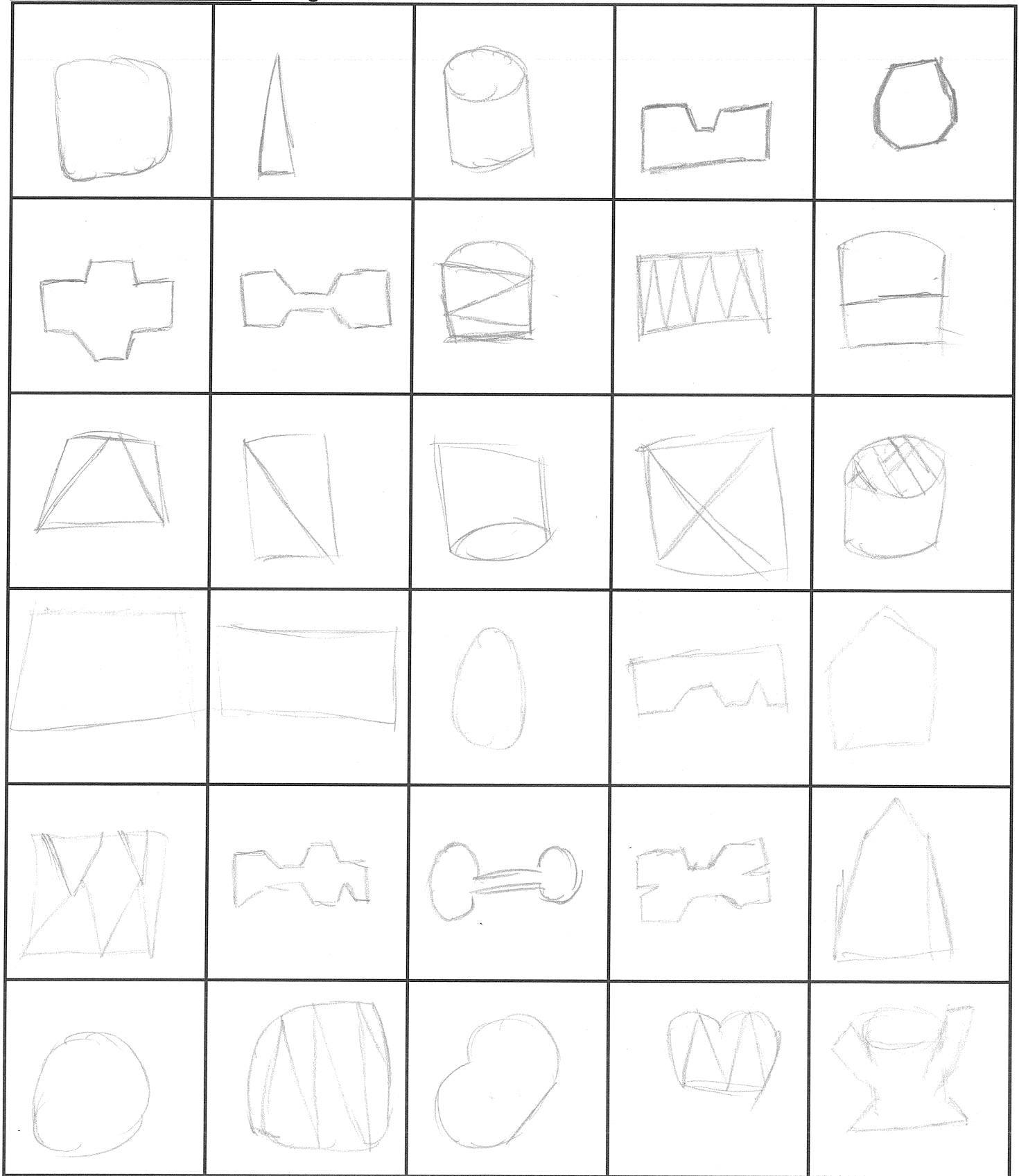
The whole structure must be 3" wide x 3" deep x 2" tall

Must be constructed out of ONLY one sheet of computer paper and 6" of masking tape

Research Background Information:

Structure:	An object that transfers weight or pressure.
Pressure	Pressure is a Force given over a given area.
Force:	A push or pull. Force only moves in straight lines. Force needs a balance "if there is push there has to be a pull."
P.S.I.	Pound per square inch.
Compression:	Compression = pushing force.
Tension:	Tension = pulling force.
Reinforcement	The strengthening of something weak with other additional materials.
Invention:	The creation of something new, a new object, process, idea, anything NEW.
Innovation:	Using inventions to make them more marketable. Combining existing into something else.

Possible Solutions: Rough Sketches



Name: _____		Period: <u>46</u>	
Project: <u>Paper Cush</u>		Attempt #: <u>1</u>	
Sketch:  			
Success:	Reason For Failure:		Solution:
1. <u>25</u>	I think that I failed because of how it didn't have any support in the middle.		I think that I will have to try to put more support in the middle.
2. <u>20</u>	I think that I failed because it didn't have any support in the middle and I put it on the side.		I think that I will have to find something else to try in the middle.
3. <u>30</u>	I think that I failed because the supports were not in the middle where the shin and not strong.		I think that I will try to put better supports and more supports.

Name: _____		Period: <u>46</u>	
Project: <u>Paper Cush</u>		Attempt #: <u>2</u>	
Sketch:			
Success:		Solution:	
1. <u>7</u>	I think the reason I failed was because it was weak and not very supported.	I think that I will put more supports and try to make it stronger.	
2. <u>5</u>	I think that my reason for failure was because it could not support the pressure and it just smoothed into the middle.	I think that I will put more supports in the middle.	
3. <u>5</u>	I think that it's because I only put supports around one spot and not all of the spot.	I will put supports in all spots.	

Name: _____		Period: <u>46</u>	
Project: <u>Paper Crush</u>		Attempt #: <u>3</u>	
Sketch:			
Success:		Reason For Failure:	
1. <u>2</u>	I think the reason I failed was because I didn't have any support on the middle part of it.	I will put supports in where I stapled it.	
2. <u>4</u>	I think that it was because I forgot to put the supports evenly apart.	I will try to put the supports more evenly.	
3. <u>0</u>	I think that it was with in the middle	I will put more supports in the middle	

Name: _____			Period: <u>26</u>		
Project: <u>Paper Crush</u>			Attempt #: <u>1</u>		
Sketch:					
Success:	Reason For Failure:	Solution:			
1. <u>16lbs</u>	<u>Pound went down</u>	<u>more support inside</u>			
2. <u>38lbs</u>	<u>The columns got crushed</u>	<u>more columns</u>			
3. <u>100 lbs</u>	<u>columns bent in</u>	<u>tighter columns</u>			

Name: _____

Period: 26

Project: _____

paper crush

Attempt #: 3

Sketch: _____

Success:

Reason For Failure:

Solution:

1. 20

not much support
in the middleadd three columns
around the cylinder

2. 30

started carving in
the middleadd more columns
around the whole thing

3. 21

the columns weren't
secured enough, so middle
collapsed againsecure the support
with more tape and
maybe add more columns

Name:		Period:	26
Project:	paper crush	Attempt #:	4

Sketch:

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Success:

Reason For Failure:

Solution:

1. 15

the top crushed

try a side square instead

2. 5

the square didn't help, and it still caved in

try a diamond

3. 16

the diamond held for a little but

add 3 columns around inside

the top crushed

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Name:	Period:	19
Project:	Attempt #:	1
Sketch:		
Success:		
1. O pds	Reason For Failure:	Solution:
2. 1 pds	Reason For Failure:	Solution:
3. O pds	Reason For Failure:	Solution:

Prototype and Experiment: Testing Ideas

Refined Solutions: Detailed Sketches

Name: _____		Period: _____	
Project: _____		Attempt #: _____	
Sketch: _____			
Success:		Reason For Failure:	
1. 30 Pds	The pegs that kept it together popped then it ruined.		
2. 50 Pds	It started sinking and then went pop.		
3. 3 Pds	The top started to collapse then the whole thing did.		
Solution:		Added more pegs and held it up more.	
But it stayed up and did not fall until ten lbs.		I put one skinny paper pole in the middle it helped.	

Name: _____	Period: _____
Project: _____	Attempt #: _____
Sketch:	

Success:	Reason For Failure:	Solution:
1. 6 Pds	I didn't tape it good enough so it busted, the top did.	I put more little Poles in it to make it sturdy.
2. 3 Pds	The paper Poles I put in it failed.	I put Paper Poles on each side including middle.
3. 5 Pds	The sides were not taped good enough.	It held until I got two four.

Name: _____		Period: _____	
Project: _____		Attempt #: _____	
Sketch: _____			
Success:	Reason For Failure:	Solution:	
1. 1 Pds	For the triangle I put zero poles to see what it would do.	The tip held it up then it crashed.	
2. 0 Pds	I tried again without paper poles and it did not work.	I taped it good that's why it didn't fall immediately.	
3. 3 Pds	The sides popped in then the whole thing did.	I put paper poles.	

Analysis and Evaluation: How did I do?

Answer the following questions with at least a complete paragraphs (three complete sentences), question 1 NEEDS to be one sentence. Sentence structure, spelling, and grammar count.

1. How much pressure did your artifact hold?	My artifact held 45 pounds.
2. What did you do well?	I think I did well with building the structure. Also, the planning and scetching before-hand. Lastly, I did alright with thinking how to make my objects better.
3. What did you do poorly?	I think I didn't add enough support (columns) to this final test. Also, not adding enough tape to the right places. Finally, I sort of rushed some of the columns.
4. What did you observe during the testing of your artifact?	The middle of the cylinder started caving in. A piece of tape nearly fell off. Plvs, half of the top smushed at the top and half didn't, because it was uneven.
5. What should you have changed about your artifact before you tested it?	I could have secured the columns a little more. Maybe made sure that the top and bottom were level. Plvs, added more columns.
6. What did you learn from doing this project? (Process/Construction/Testing)	I learned lots about going through the process of experimenting. I feel I got a lot better at problem solving as well.

7. What would you change if you had to do this again?	taking my time building the artifacts and put in deeper thought to my ideas
8. Define Invention.	the creation of something new (ideas, objects, processes)
9. Define Innovation.	using inventions to make them more marketable
10. Apply the ideas learned about the problem solving process during this project beyond the classroom.	These ideas can be used in math class, when solving problems. And science class, when experimenting. Another place this could be applied is on the field hockey field, which I'm on a lot. I could try new things and experiment during practice or games.
11. Honestly what grade do you feel that you earned?	1 1.5 2 2.5 3 3.5 4