

Name:

Date:

Class:

Activity Problem Solutions

Next are the solutions of the proposed problems. Teacher may also, using the Google Slides Calculation Interface and the Cost Worksheet to design new problems.

	Truss	Span (in)	# Triangles	Total Load (lbf)	Budget (Bitcoins)	Braces/ Rails (in)	Diagonals/ Verticals (in)	Wood
1	Warren	20	7	250	2,000	1/4 square	1/4 round	Hardwood
2	Warren	30	9	270	4,300	5/16 square	1/4 square	Hardwood
3	Warren	36	11	250	5,500	5/16 square	1/4 round	Hardwood
4	Warren w/V	20	7	245	2,700	1/4 square	1/4 round	Hardwood
5	Warren w/V	30	9	250	5,700	5/16 square	1/4 round	Hardwood
6	Warren w/V	36	11	250	7,700	5/16 square	1/4 round	Hardwood
7	Howe	24	10	250	3,600	5/16 square	1/4 round	Hardwood
8	Howe	32	14	245	4,500	5/16 square	1/4 round	Hardwood
9	Howe	36	18	240	6,400	5/16 square	1/4 round	Hardwood
10	Pratt	24	10	250	3,600	5/16 square	1/4 round	Hardwood
11	Pratt	32	14	245	4,500	5/16 square	1/4 round	Hardwood
12	Pratt	36	18	240	6,400	5/16 square	1/4 round	Hardwood

Notes to teacher:

- These problems are designed to be tested to their limits with standard classroom resources. Usually in every classroom there are two textbooks sets that may have an approximate weight of 250 pounds. These textbooks can be used to load the bridge. Even though you may borrow some iron weights from the school gym, in case the bridge fails it is more dangerous iron weights falling than textbooks. Iron weights may also damage your room's floor

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- Hardwood is used because is the wood that has the lowest crushing strength and can fail because the textbooks weight. These problems also require students to determine the correct dowels thickness and wood in order to fit the assigned budget. Try to include thicker elements or other woods will be out of the assigned budget, and it will require more weight to test the bridges to their limits
- The wood and thicknesses in table are enough to resists the specified loads, but bridges may fail because a defective construction, elements not straight or defective, diagonal/ vertical elements not joining properly to the rails, elements not well glued or glued only on the gussets, or trusses not vertically aligned. These are some of the elements students may conclude in case their bridges fail.