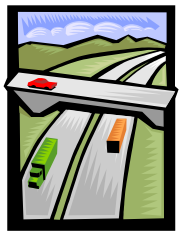
Name: _____ Date: _____

Materials Data Sheet
Answer Example



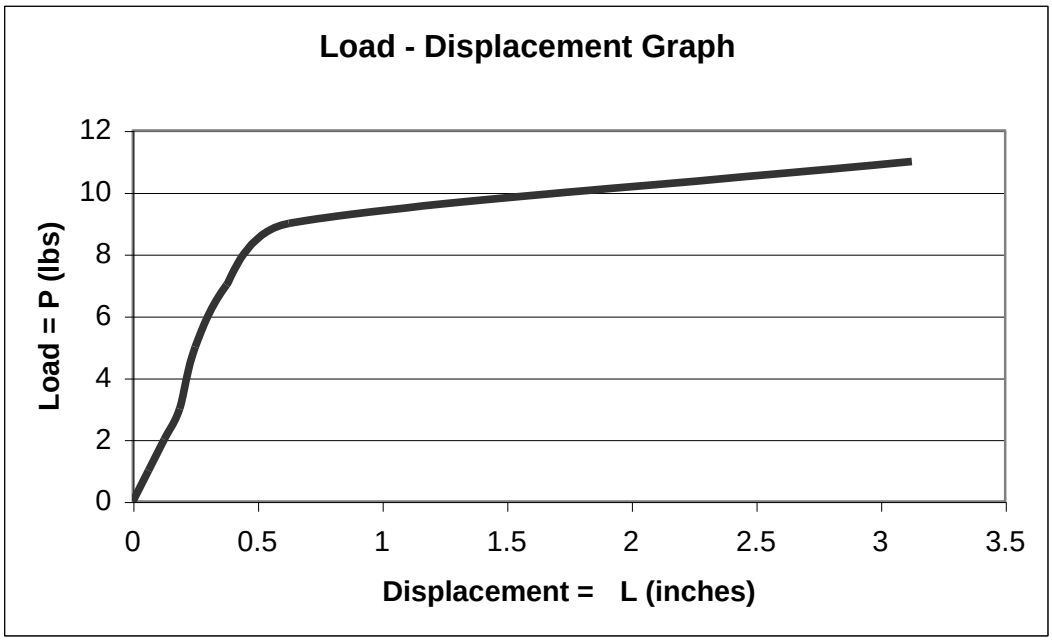
1. Complete the table below using data obtained from the experiment.

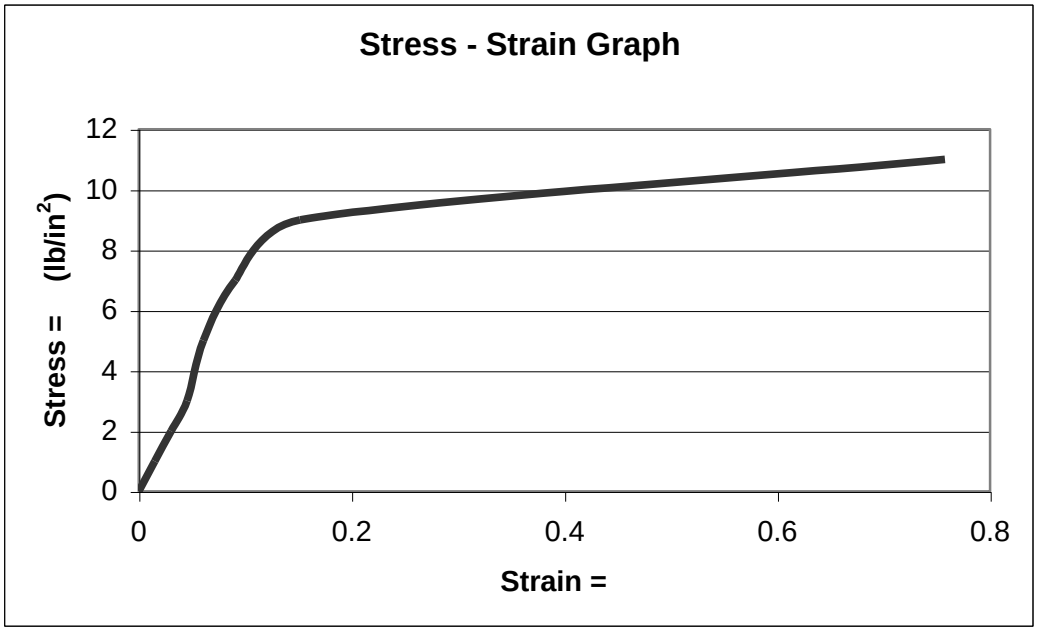
Trial #	Number of books	Weight of books (lbs) P	Height of clay (in) L	Change in height (in) $\Delta L = L_o - L$	Strain $\varepsilon = \Delta L \div L_o$	Area of clay (in^2) A	Stress (lb/in^2) $\sigma = P \div A$
Example	2	2	$L_o = 3$ $L = 2.5$	0.5	0.5/3 = 0.17	1	2/1 = 2
Initial			L_o =				
1	1	1	4.0625	.0625	0.01515	1	1
2	2	2	4	.125	0.03030	1	2
3	3	3	3.9375	.1875	0.04546	1	3
4	4	5	3.875	.25	0.06061	1	5
5	5	7	3.75	.375	0.09091	1	7
6	6	9	3.5	.625	0.15152	1	9
7	7	11	1	3.125	0.75758	1	11

For reference — decimal values for fractions:

1/16 = 0.0625	1/8 = 0.125	3/16 = 0.1875	1/4 = 0.25
5/16 = 0.3125	3/8 = 0.375	7/16 = 0.4375	1/2 = 0.5
9/16 = 0.5625	5/8 = 0.625	11/16 = 0.6875	3/4 = 0.75
13/16 = 0.8125	7/8 = 0.875	15/16 = 0.9375	16/16 = 1

2. Complete the graphs below using the data from the table. Create an appropriate scale for the horizontal and vertical axes. Calculate the modulus of elasticity using the lower graph.

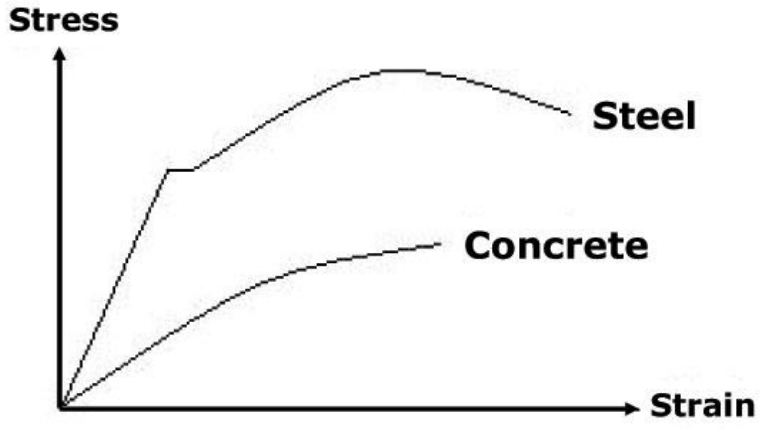




Modulus of elasticity (E) = rise ÷ run = Change in height between two data points ÷ Change in horizontal distance between same points

Modulus of elasticity = 79.2 (lb/in^2) using data points from trials 1 and 5

3. **Compare the graph below for steel and concrete with the graphs created for your experiment. How does clay compare to steel and concrete?**



4. **Compare the modulus of elasticity for steel and concrete given below with the value computed from the experiment. How does clay compare to steel and concrete?**

Modulus of elasticity of clay = _____

Modulus of elasticity of steel = 29,000,000 lb/in^2

Modulus of elasticity of concrete = 3,600,000 lb/in^2