

Graphing and Predicting – Overhanging Blocks #2

Objective: Stack blocks on top of each other so that the top block extends out horizontally as far as possible without tipping the stack. Make a quantitative prediction as to how large the overhang can be for a given number of blocks.

Obtain 6 type “C” blocks, a meter stick and a straight edge.

1. Using just two blocks. Measure the largest overhang you can obtain. Record your measurement in the table below.
2. Using three blocks determine the largest overhang you can obtain. Again, measure the overhang and record it in the table.
3. Repeat the above step for 4, 5 and 6 blocks.

Number of Blocks	Maximum Overhang Obtained (cm)
2	
3	
4	
5	
6	

4. Plot a graph showing the data you have obtained. Some general rules for graphing are:

Graphs should always be done on graph paper and should take up most of the space on the page.

Graphs should always have a title summarizing what the graph represents.

Each axis should be clearly labeled with the name or symbol of the quantity being plotted along with the appropriate units.

When graphing data the independent variable is plotted on the horizontal axis and the dependent variable is plotted on the vertical axis. Your data table has two columns: a column of number of blocks and a column of maximum overhang obtained. Which of these is the independent variable and which is the dependent variable?

Once you have determined which information is to be plotted on each axis, you must determine the best way to set up your graph. Some questions to be asked include:

What is an appropriate title for the graph?

Should the horizontal axis or the vertical axis be longer?

What is an appropriate range for each axis?

What is an appropriate scale for each axis?

You will be using this graph to predict the maximum overhang possible for 7 and 8 blocks, so make sure these are included within the range of number of block values. It is often a very good idea to know exactly how a graph will be used before actually creating a graph.

When graphing, data it is important to be aware that all data contains some random error. It is therefore never useful to connect successive data points with straight line segments. It is best to draw a smooth curve that comes near or passes through each data point.

5. Draw a smooth curve that passes through or near each of your data points. Use your smooth curve to predict the maximum overhang possible using 7 blocks. Also predict the maximum overhang possible using 8 blocks. Since you are making a scientific prediction, you should be extending your curve by *continuing the trend*. You should not first *guess* values for 7 and 8 blocks and draw a curve that supports your guess.

Number of Blocks	Predicted Maximum Overhang (cm)
7	
8	

6. Test your predictions by repeating step 2 above for 7 and 8 blocks. And record your experimental overhang.

Number of Blocks	Maximum Overhang Obtained Experimentally (cm)
7	
8	

7. Were you able to reach the predicted overhang? Were you able to exceed the predicted overhang?