

## THINKING WITH MATHEMATICAL MODELS

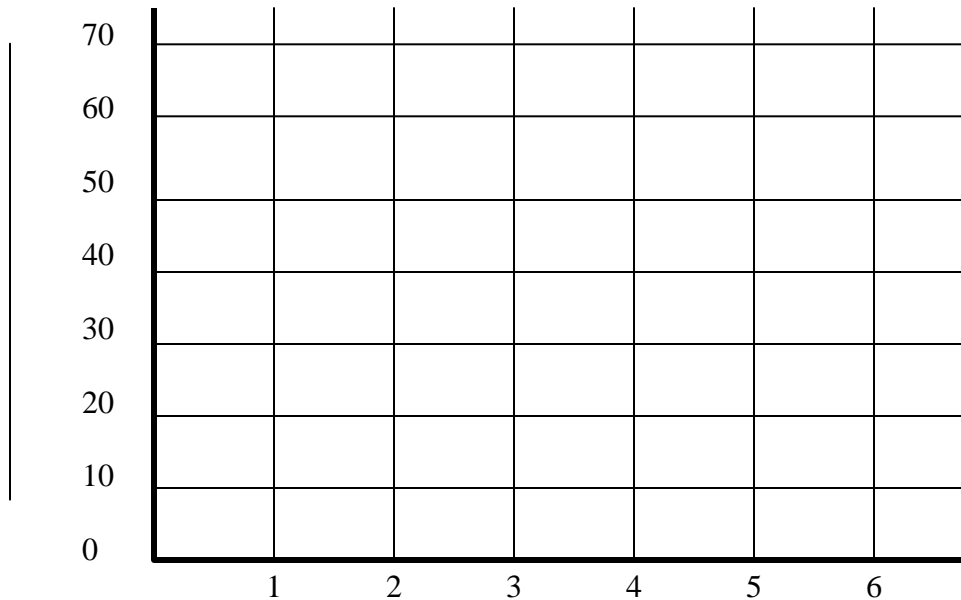
INV 1 – ACE #1, 2, 12 - 15 pg. 12-18

- 1.) A group of students conducts the bridge-thickness experiment with construction paper. Their results are shown in this table.

Thickness (layers)	1	2	3	4	5	6
Breaking Weight (# of pennies)	12	20	29	42	52	61

- a) Label and complete the graph of the data.

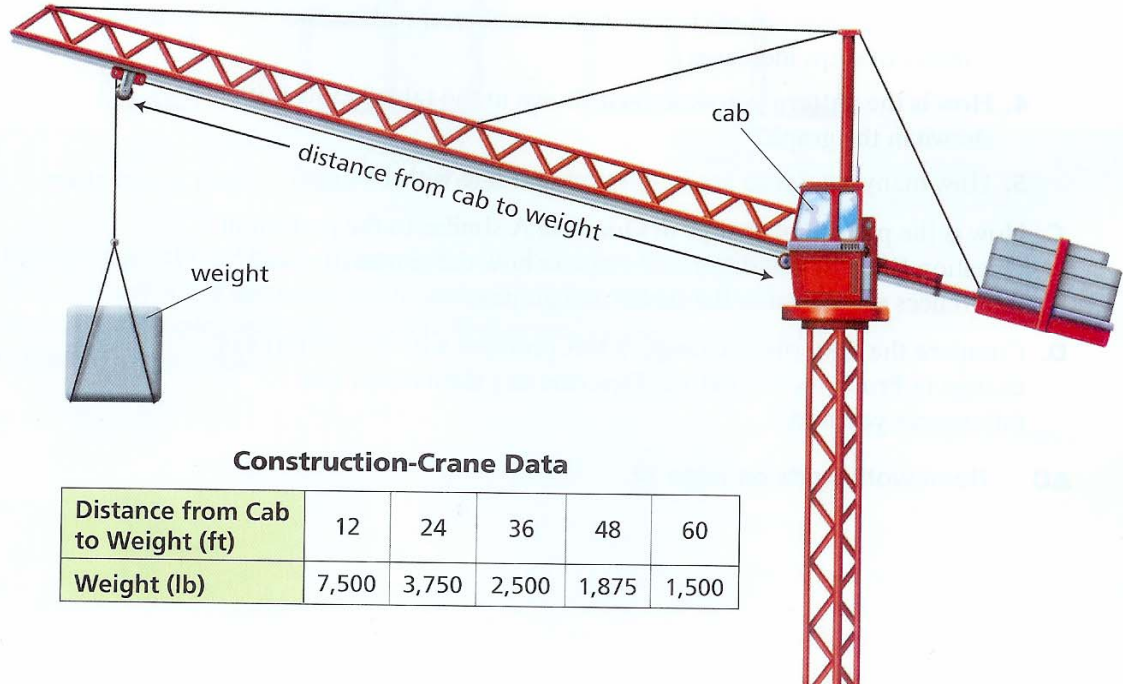
**Bridge-Thickness Experiment**



- b) Suppose it is possible to use half-layers of construction paper. What breaking weight would you predict for a bridge 3.5 layers thick? ***Explain your answer.***

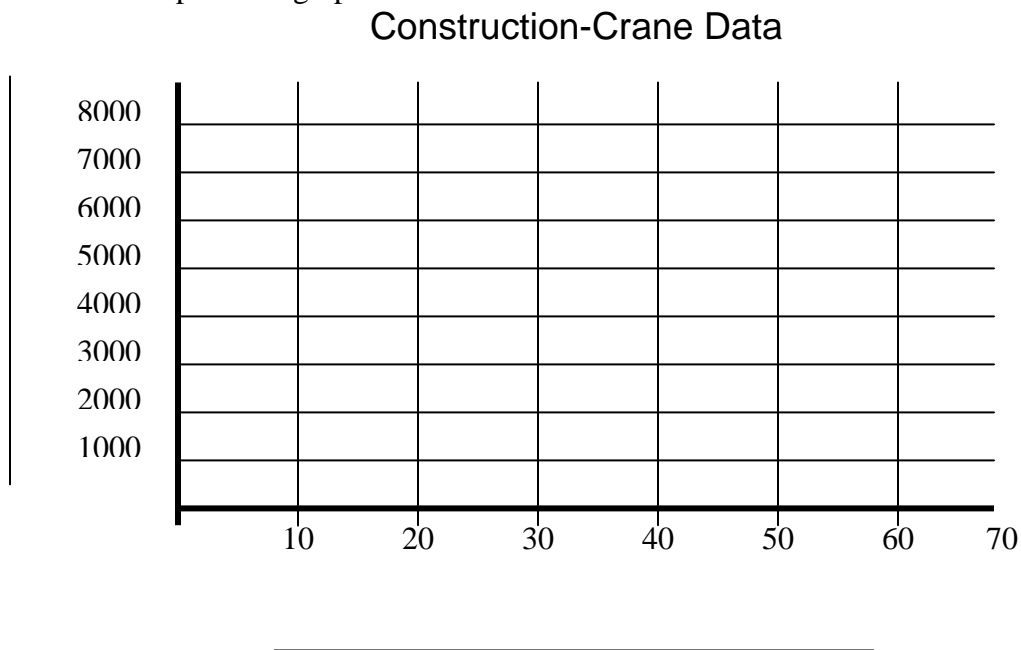
- c) Predict the breaking weight for a bridge 8 layers thick. ***Explain how you made your prediction.***

2.) The table shows the maximum weight a crane arm can lift at various distances from its cab. (See the diagram.)



a) Describe the relationship between distance and weight for the crane.

b) Label and complete the graph of data.



c) Estimate the weight the crane can lift at distances of 18 feet, 30 feet, and 72 feet from the cab.

18 ft.?

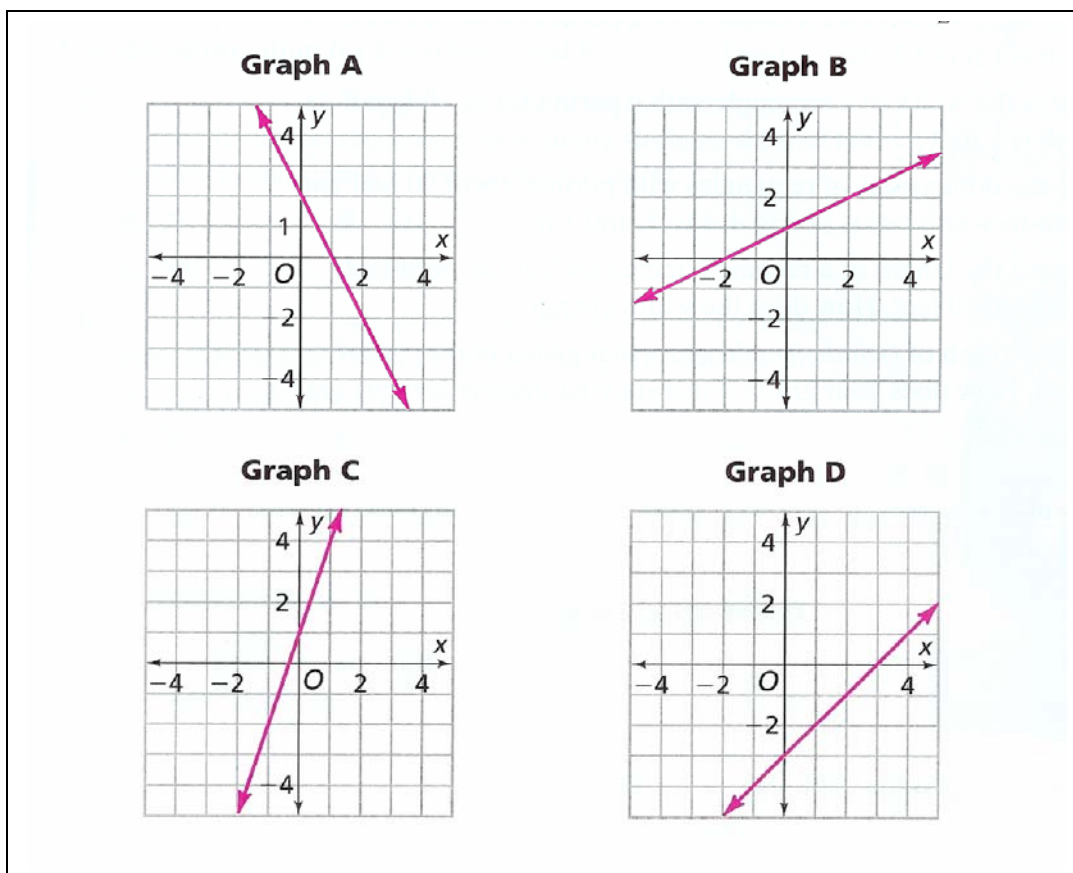
30 ft.?

72 ft.?

## THINKING WITH MATHEMATICAL MODELS

INV 1 – ACE #1, 2, 12 - 15 pg. 12-18 continued

In 12 through 15, tell which graph matches the equation or set of criteria.



12.)  $y = 3x + 1$

Graph \_\_\_\_\_

13.)  $y = -2x + 2$

Graph \_\_\_\_\_

14.)  $y = x - 3$

Graph \_\_\_\_\_

15.) y-intercept = 1; slope =  $\frac{1}{2}$

Graph \_\_\_\_\_