Warm Up

9/3

Evaluate the following if $a = -3$, $b = 8$, and $c = -4$

1. $9a - 2ab$

$9(-3) - 2(-3)(8)$

$-27 - 2(-24)$

$-27 + 48$

Same as

$48 - 27 = 21$

Or

$9(-3) - 2(-3)(8)$

$-27 + 6(8)$

$-27 + 48$

21

2. $a^2 + 7c - 1$

$(-3)^2 + 7(-4) - 1$

$9 - 28 - 1$

$-19 - 1 = -20$

Inv. 1.1 Recap

Class Data

Thickness (# of layers)	1	2	3	4	5
# of pennies Group 1	6	12	17	25	38
# of pennies Group 2	5	14	18	24	39
# of pennies Group 3	5	12	16	27	36
# of pennies Group 4	5	11	19	25	36
# of pennies Group 5	4	9	18	26	42
	5	9	15	36	36

?

Is this real?

What do you notice?

- seems to be similar between groups
- breaking weight increases with thickness

What could cause the variations in the data?

Variation can be due to experimental error:

- how you folded
- how pennies were dropped
- was cup in center
- was there the 1" overlap on the book

Sample data:

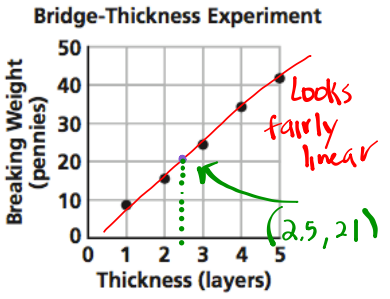
change in "x"

+1 +1 +1 +1

Bridge-Thickness Experiment

Thickness (layers)	1	2	3	4	5
Breaking Weight (pennies)	9	16	24	34	42

+7 +8 +10 +8



Average increase = 8.25

B Does the relationship between the number of layers and the breaking weight seem to be linear or nonlinear? How do the graph and the table show this relationship?

Linear

- table: as the thickness increases by 1 breaking wt increases by ~ 8.25
- Graph: looks linear

C Suppose you could split layers of paper in half. What breaking weight would you predict for a bridge 2.5 layers thick? Explain.

(2.5, 20)

- check the differences on the table, divide by 2

D Predict the breaking weight for a bridge 6 layers thick. Explain your reasoning.

average

Find the mean of the differences of the breaking weights and added to the weight for 5 layers.

predictions can be made using both the table and graph

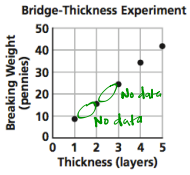
Problem 1.1 Wrap Up

Sample data:

Bridge-Thickness Experiment

Thickness (layers)	1	2	3	4	5
Breaking Weight (pennies)	9	16	24	34	42

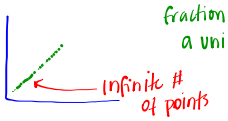
Should we connect our data points?



If discrete cannot have a fraction of a unit

What is a line?

an infinite # of data points

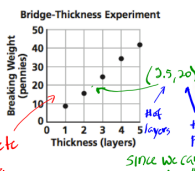


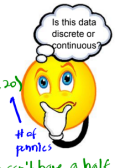
We can split our units into fractions } Continuous Data

Discrete Data

Because in our experiment we cannot have a portion of a thickness of a sheet of paper, or a portion of a penny, we **cannot** connect our data points.

Should we connect our data points?

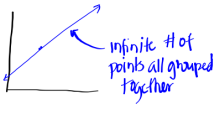




Discrete Data

since we can't have a half a thickness, this cannot be a data point!

What is a line?



Each point represents an actual data point

You can only connect your data points if you can have fractions of your units. } Continuous Data

Discrete Data

Because in our experiment we cannot have a portion of a thickness of a sheet of paper, or a portion of a penny, we **cannot** connect our data points.

Always look at units if you want to know if you can connect your data points

Classwork

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2. A group of students conducted the bridge-thickness experiment with construction paper. The table below contains their results.

Bridge-Thickness Experiment

Number of Layers	1	2	3	4	5	6
Breaking Weight (pennies)	12	20	29	42	52	61

a. Make a graph of the (number of layers, breaking weight) data. Describe the relationship between breaking weight and number of layers.

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.

★ **c.** Predict the breaking weight for a construction-paper bridge of 8 layers. Explain how you made your prediction.

Homework

Finish Classwork