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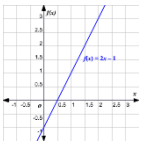
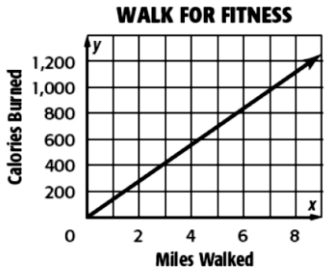


Algebra U7L4 - Making Predictions with Lines of Best Fit

Warm Up…

A.3C – real world linear funtions:
Linda saw the following graph in a fitness magazine.



Which does the slope of the graph represent?

A.2C – write equation from table or graph:
Write an equation for the situation represented in the table at the bottom of this box

Recent Review:
Suppose y varies directly with x, and y = 16 when x = 8. Find y when x = 16

Your distance from lightning varies directly with the time that it takes you to hear thunder. If you hear thunder 10 seconds after you see lightning, you are about 2 miles from the lightning. Write a direct variation equation for the relationship between time and distance.

Number of toppings, t	0	1	2	3	4	5
Total cost ($), C	8	10	12	14	16	18

Today's Goal:

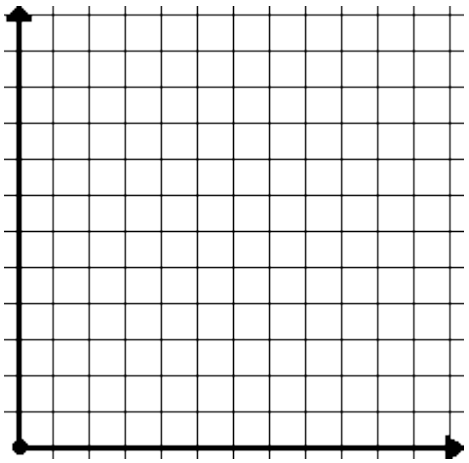
- KWBAT write linear functions that provide a reasonable fit to data to estimate solutions and make predictions for real-world problems
- WHY? This is Algebra standard A.4C which is very powerful! It can be used to look at prior data and make predictions about future data even if the data doesn't form a perfectly straight line. Statisticians use this skill ALL the time to make predictions!

Example 1: Blueberries!

BLUEBERRIES The table shows the weights y of x pints of blueberries.

Number of Pints, x	0	1	2	3	4	5
Weight (pounds), y	0	0.8	1.50	2.20	3.0	3.75

a. Graph the data in the table.
b. Draw the straight line that you think best approximates the points.
c. Write an equation of the line you drew.
d. Use the equation to predict the weight of 10 pints of blueberries.
e. Blueberries cost $2.25 per pound. How much do 10 pints of blueberries cost?

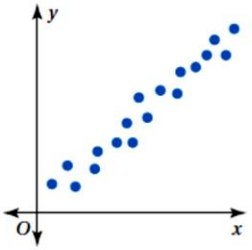


Point-Slope Form: $y - y_1 = m(x - x_1)$

Coordinate (x_1, y_1) slope m

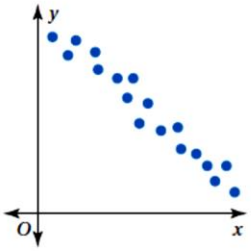
A scatter plot can show that a relationship exists between two data sets.

Positive Relationship



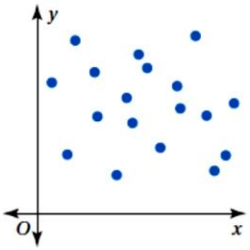
As x increases, y increases.

Negative Relationship



As x increases, y decreases.

No Relationship



The points show no pattern.

Work with a partner. You have been working on a science project for 8 months. Each month, you have measured the length of a baby alligator.

The table shows your measurements.

	September							April
Month, x	0	1	2	3	4	5	6	7
Length (in.), y	22.0	22.5	23.5	25.0	26.0	27.5	28.5	29.5

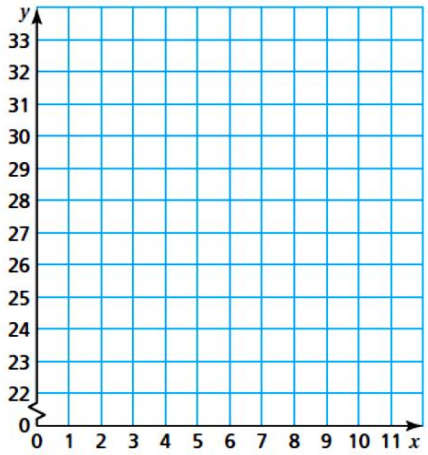
Use the following steps to predict the baby alligator's length next September.

a. Graph the data in the table.

b. Draw the straight line that you think best approximates the points.

c. Write an equation of the line you drew.

d. Use the equation to predict the baby alligator's length next September.



2 ACTIVITY: Representing Data by a Linear Equation

Work with a partner. You are a biologist and are studying bat populations.

You are asked to predict the number of bats that will be living in an abandoned mine in 3 years.

To start, you find the number of bats that have been living in the mine during the past 8 years.

The table shows the results of your research.

7 years ago — this year

Year, *x*	0	1	2	3	4	5	6	7
Bats (thousands), *y*	327	306	299	270	254	232	215	197

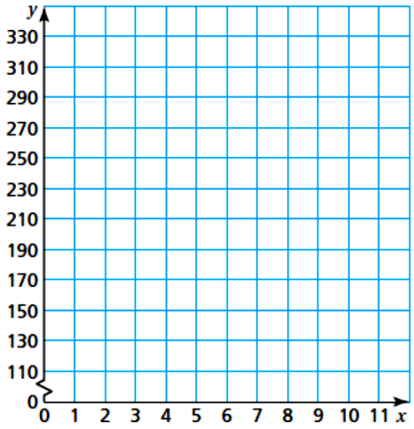
Use the following steps to predict the number of bats that will be living in the mine after 3 years.

a. Graph the data in the table.

b. Draw the straight line that you think best approximates the points.

c. Write an equation of the line you drew.

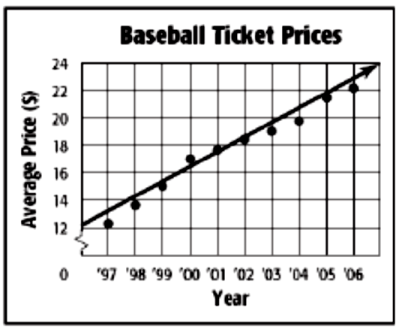
d. Use the equation to predict the number of bats in 3 years.



BASEBALL The scatter plot shows the average price of a major-league baseball ticket from 1997 to 2006.

a. Use the points (2001, 17.60) and (2002, 18.75) to write the slope-intercept form of equation for the line of fit shown in the scatter plot.

b. Use your equation to tell the price of a ticket in 2009. Is this extrapolation or interpolation?



Source: Team Marketing Report, Chicago

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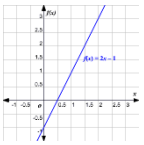

EXIT TICKET - Algebra U7L4 - Making Predictions with Lines of Best Fit

VACATION The table shows the distance you travel over a 6-hour period.

a. Make a scatter plot of the data.

b. Draw a line of best fit.

c. Write an equation of the line of best fit.

d. Predict the distance you will travel in 7 hours.

Hours, x	Distance (miles), y
1	62
2	123
3	188
4	228
5	280
6	344