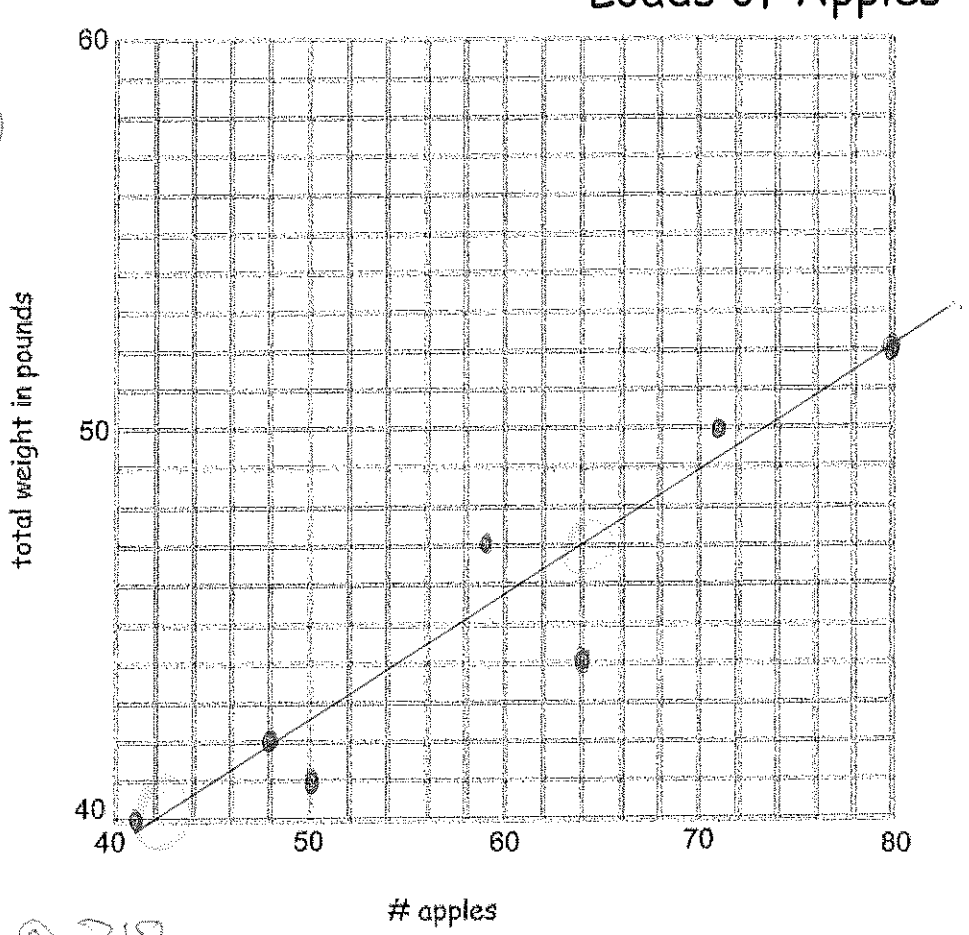
Name KEY Answers will vary slightly Line of Best Fit

Wheelbarrows were used to haul apples from an orchard. Each load was weighed then the apples were counted. Following are the data collected.

# Apples	48	41	50	59	64	71	80	66
Total Weight (pounds)	42	40	42	47	44	50	52	46

1. Make a graph of the data and draw a line of best fit.



2. Find two points on the line. Record them here:
(42, 40) (64, 47)

3. Find the slope using the points:
$m = \frac{47-40}{64-42} = \frac{7}{22} = 0.318$

4. Use one of your points and the slope in the equation $y = mx + b$ to solve for b.

5. Write your final equation:
Use (42, 40)
$40 = 0.318(42) + b$
$40 = 13.356 + b$
$26.64 = b$
$y = 0.318x + 26.64$

6. The slope represents the weight of each apple. Find the weight of each apple in ounces (there are 16 ounces in a pound.)
$16 * 0.318 = 5.1$ ounces

7. What does the y-intercept represent? Hint: It's the weight of something.
It's the weight of the wheelbarrow.

The following table shows the life expectancy of people born in the US between 1900 and 1990.

Year	1900	1910	1920	1930	1940	1950	1960	1970	1980	1990
Life Expectancy (Years)	47.3	50.0	54.1	59.7	62.9	68.2	69.7	70.8	73.7	75.4

1. Make a graph of the data and draw a line of best fit.

2. Find two points on the line. Record them here: (1905, 50) (1990, 77.5)

3. a. Find the slope using the points: $m = \frac{77.5 - 50}{1990 - 1905} = \frac{27.5}{85} = 0.32$

b. What is the meaning of the slope (describe in words.)? Does this make sense? Explain.
Each year, life expectancy goes up by about 0.32 years. Yes

4. Use one of your points and the slope in the equation $y = mx + b$ to solve for b.
$50 = 0.32(1905) + b$
$50 = 609.6 + b$ $b = -559.6$

b. What is the meaning of the y-intercept (describe in words.)? Does this make sense? Explain.
The life expectancy at Year 0 is -559.6 years. It does not make sense because life expectancy can't be negative.

5. Write your final equation:
$y = 0.32x - 559.6$

6. Use your equation to predict the life expectancy in the following years. Show your work.

a. 1978
$y = 0.32(1978) - 559.6$
$= 632.96 - 559.6$
$= 73.36$ years

b. 1994
$y = 0.32(1994) - 559.6$
$y = 638.08 - 559.6$
$= 78.48$ years

c. 2009
$y = 0.32(2009) - 559.6$
$= 642.88 - 559.6$
$= 83.28$ years

7. Use your equation to predict when the life expectancy will reach 90 years. Show work.
$90 = 0.32(x) - 559.6$
$649.6 = 0.32x$
$2030 = x$

8. Use your equation to predict when the life expectancy will reach 100 years. Show work.
$100 = 0.32(x) - 559.6$
$659.6 = 0.32x$
$\approx 2061 = x$

Life Expectancy in U.S.