

Bell Activity:

Solve the following system of equations:

$$100 = ae^{2b}$$

$$300 = ae^{4b}$$

**THINK!!...we
will use this in
today's lesson!**



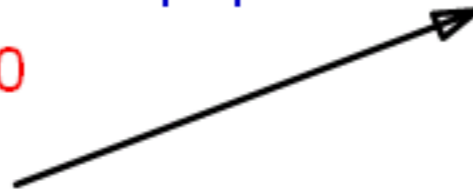
Population Growth

Below are estimates of the world population (in millions) from 1992 to 2000

1992	1993	1994	1995	1996	1997	1998	1999	2000
5445	5527	5607	5688	5767	5847	5926	6005	6083

Your task: (a) Create a scatterplot using the data in the table and (b) find an **exponential** function that models the data. (c) Use your GUT to determine the year for which the world population is 6.5 billion. (6500million)

let $t = 0$ represent 1990



The "a" and "b"
vary depending
on the situation

From information you can get two points in form of (t,y)
where t is time (in days) and y is # of fruit flies.

The two points are (2,100) and (4,300)

Now, sub these two points into the Law of exponential growth formula:

$$100 = ae^{2b}$$

$$300 = ae^{4b}$$

Look familiar?!

Solving this as we did in the bell activity you get $b = \frac{1}{2}\ln 3$ or 0.5493 and $a = 33.33$

So your exponential model for the population growth of fruit flies is

$$y = 33.33e^{0.5493t}$$

Now, can you determine the number of flies after 5 days?

see ex 3 on page 261 on [carbon dating](#)!

ex 4 on page 262 is about [SAT scores](#)!

ex 5 on page 263 is about the [spread](#) of a [virus](#) (Swine flu, maybe?!)!

ex 6 on page 264 is about the [magnitudes](#) of [earthquakes](#)...[did](#) you know that the [Richter scale](#) for measuring earthquakes is a logarithmic scale?!

If Ms. Welch invests \$20,000 in an account that pays an annual interest rate of 10.5% determine (a) how long will it take for her account to double?

(b) how much will she have after 10 years?

(c) where is she gonna get \$20,000 to invest?!

(assume the interest is compounded continuously)

(a)

(b)

(c)

Let $N = 200e^{kt}$ represent growth for a certain colony of bacteria in your bookbag. At time $t = 3$ days, the number of bacteria $N = 2453$.

(a) Find an exponential equation to model how many bacteria are in this bookbag after t days.

(b) How many bacteria are in the bookbag after 10 days?