

# How Americans Got So Jittery

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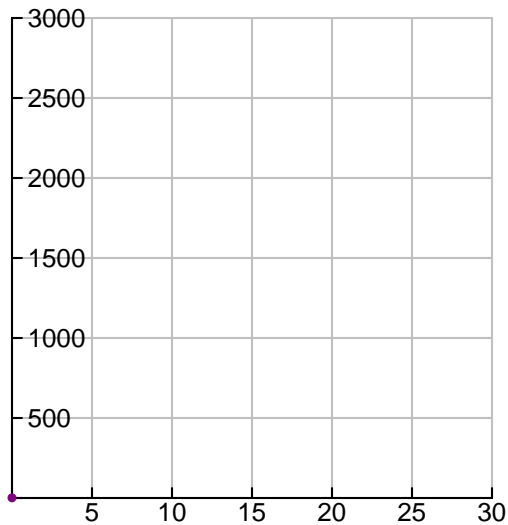
Name \_\_\_\_\_

Date \_\_\_\_\_

A cup of coffee, just isn't a cup of coffee anymore. Now it has become a social event. Seattle-based Starbucks has grown and grown. Let's take a look at the growth since the company's inception and try to predict where they are going.

Visit the Starbucks website, <http://www.starbucks.com> to read about the history of the company including the Company Overview Time Line. Starting with 1971, record the year and the number of stores through the end of 1999 in the table below.

Year	Time	Stores
1971	0	1



1. Create a scatter plot of the number of stores versus the years since 1971.
2. Adjust the initial population,  $a$ , and the growth factor,  $b$ , of the function,  $y = ab^x$ , until you have a good exponential fit for this data. Graph and record the function.
3. Interpret the meaning of  $a$  in your function  $y = ab^x$  including the units.
4. Interpret the meaning of  $b$  in your function  $y = ab^x$ .
5. How well does the exponential model fit this data set? Explain.
6. Adjust  $a$ ,  $b$ , and  $d$  of the function  $y = ab^x + d$  to find a better fit of this data. Graph and record the function.
7. Develop a piecewise function that would fit this data. Graph and record this function.
8. Use these three functions to predict the number of Starbucks locations in the following years: 1980, 1990, 2000, 2050.

9. How well do your functions predict the number of Starbucks locations in each of the years in the table above compared to the data from the Starbucks Company Time Line? Explain.
10. Which function do you think better predicts to number of Starbucks locations from 1971 to 2000? Explain.