

## Annual Facebook Growth Has the growth of Facebook peaked?

Facebook has been an amazingly successful phenomenon. Mark Zuckerberg created it when he was only a sophomore at Harvard College. His first iteration of Facebook was called Facemash. He was 20 years old when he first opened the site on October 28, 2003.

The initial site generated 450 visitors and 22,000 photo-views in its first four hours online. That means that 450 unique visitors visited the site and they viewed 22,000 photos.

1. On average, about how many photos did each visitor view in that first 4 hours of Facemash?

Then in February 4, 2004, Zuckerberg launched "Thefacebook", originally located at thefacebook.com. Membership was initially restricted to students of Harvard College, and within the first month, more than half the undergraduate population at Harvard was registered on the service. In 2004, Harvard's undergraduate population was 7,000 students.

2. About how many users registered to "thefacebook" in that first month of its existence?

In March 2004, Facebook expanded to Stanford, Columbia, and Yale. This expansion continued when it opened to all Ivy League schools, Boston University, New York University, MIT, and gradually most universities in Canada and the United States.

Facebook launched a high school version in September 2005, which Zuckerberg called the next logical step. At that time, high school networks required an invitation to join. Facebook later expanded membership eligibility to employees of several companies, including Apple Inc. and Microsoft. Facebook was then opened on September 26, 2006, to every one of ages 13 and older with a valid e-mail address.

I wondered what the growth of Facebook would look like if I tried to measure its annual growth.

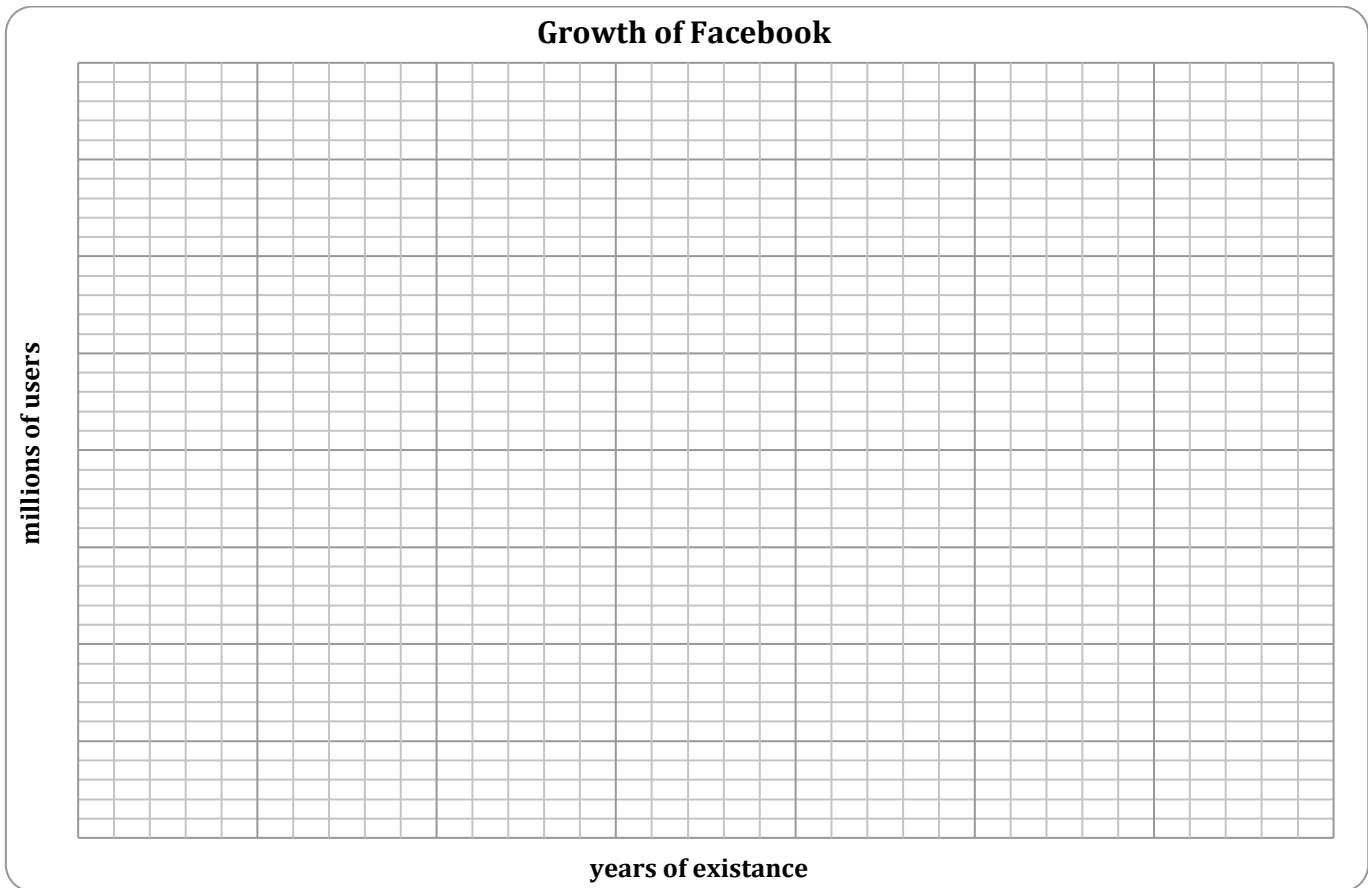
**Annual Active Facebook Users**

Date	Number of users	Percent growth
January, 2004	5	
January, 2005	1,000,000	
January, 2006	5,500,000	450%
January, 2007	12,000,000	
January, 2008	70,000,000	
January, 2009	150,000,000	
January, 2010	370,000,000	
January, 2011	600,000,000	
January, 2012	800,000,000	
January, 2013	1,056,000,000	
January, 2014	1,228,000,000	
January, 2015	1,317,000,000	

3. How might you calculate yearly growth?

4. Try to complete my table on the previous page with your method of calculating yearly growth.

5. Graph the data (number of users by date) on a scatter plot using the grid below. Make sure you are very careful marking your dates on the x-axis.



6. How would you describe the growth rate of Facebook users? Is it roughly linear, exponential, something else? Explain.

When you were an infant, your pediatrician probably kept a record of your weight and height at each of your visits partly to be able to predict your adult size and weight.

7. Predict the number of users in 2016 and 2017.
8. Do you think that the growth of Facebook is slowing down, growing or staying about the same?
9. Using the data from the table, your graph or any other resource, consider the future of Facebook. Do you think its number of users will continue to grow? If so, when will Facebook reach 2 billion users? If you think Facebook won't reach 2 billion users, when do you think Facebook will stop growing? Share your mathematical reasoning.

There are approximately 7.3 billion people in the world now. Approximately 3 billion people have Internet access.

10. What percent of the world's population has Internet access?

11. What percent of the world's population are active users on Facebook?

12. About what percent of Internet users are active Facebook users?

Sources: <http://en.wikipedia.org/wiki/Facebook>  
<http://www.internetlivestats.com/internet-users/>