I thought I should expand this population approach somewhat:

$P_t = P_0e^{kt}$ is the equation which describes population growth.

To head off the most common objections:

- This does take into account the death rate as well as the birth rate. When population figures are chosen in order to apply this formula, if anyone died in between the time periods you choose, then that means that death rate is involved as well as birth rate.

- This is an estimation. That is, the figures which are used are estimates. Even the current world population figures are estimates. Nobody has ever walked around the entire world counting heads. Just because something is an estimate does not invalidate the general conclusions. If I made a statement that the world population began on a specific date, that would be invalid. However, if I state that the world population began roughly during this century or that, then that is more in keeping with the estimations that we use.

- The formula which I have given is found in virtually every Algebra2 math book and every college algebra book in the world. When estimating world population in the future, this is essentially the formula which is used.

I used the population estimations found here:
http://geography.about.com/od/obtainpopulationdata/a/worldpopulation.htm
You can do a web search, go to a world almanac, or obtain information from wherever you desire and your results will be roughly the same.

I first gave this as a short assignment to an Algebra2 class, not knowing the outcome myself. By manipulating the data, students can come up with the population of the earth going back as little as 2000 years to as great as 50,000 years. Again, these are estimations. What we will get is a general idea as to the beginning of world population.

Matt Rosenberg, in the above web link, estimates that there were 200,000,000 people alive in the year 1 A.D. and 275,000,000 in the year 10,000. This reflects a very slow population growth.

$P_t = P_0e^{kt}$ P_t = the population after t years (t can be positive or negative; positive means we are looking forward in time;

negative means we are looking backward.

P_0 = population at time zero

t and 0 simply refer to any points in time with respect to world population figures. 0 does not mean the year 0 (which, by the way, does not exist).

e is Euler's number, although we can actually use any base to do this problem. Those who know logarithms understand this.

k = a constant, which is based upon the unit of time (years, months, days) and based upon the kind of population which is studied. Even though this is called a constant, it can vary tremendously. That is, the larger k is, the faster the population is growing. The world population does not always grow at exactly the same rate year after year after year. However, this is an estimation. By choosing figures on both sides of a time period where the world population was growing quickly (e.g., in the past 100 years), the result will be that human population began relatively recently—say, in the past 2000 years. Don't flip out over this; again, this is an *estimate*. If you choose figures on both sides of a slow population growth—e.g., on both sides of the Dark Ages—then you will get a time when man began which is artificially lengthened (you might end up with the figure that man began 25,000 years ago). Again, this is an estimation; the truth is found somewhere between these two figures.

Let's say we begin at the year 1 A.D. when there was a world population of 200,000,000 and set t = 1000 A.D. when there was a world population of 275,000,000. I should point out that this represents a time period of extremely low population growth, so that the figures will be distorted as to lengthen the time that man has been on this planet.

$P_t = P_0e^{kt}$	The population growth equation
$275{,}000{,}000 = 200{,}000{,}000\ e^{k(999)}$	plug in the figures

$275/200 = e^{k(999)}$	divide both sides of the equation by 200,000,000
$\text{Ln}\ (275/200) = \text{Ln}\ e^{k(999)}$	take the natural log of both sides
$0.318453731 = 999k$	the left side was done with a calculator; the right side is simply the application of a property of logarithms
$0.000318772 = k$	divide both sides by 999

This gives us our population growth constant, which we will use to estimate when the earth's population was 100:

$P_t = P_0e^{kt}$	the population growth equation
$100 = 200{,}000{,}000e^{(0.000318772)t}$	plug in the figures; we are beginning in the year 1 A.D. and looking backward to determine when were there 100 people on this earth; t should be a negative number when we are finished
$1/2000000 = e^{(0.000318772)t}$	divide both sides by 200,000,000
$\text{Ln}\ (1/2000000) = \text{Ln}\ e^{(0.000318772)t}$	take the natural log of both sides
$-14.5865774 = (0.000318772)t$	calculate the left side; apply properties of logs to the right side
$45{,}512 = t$	divide both sides by the constant

Let's say I choose the figures from 1 A.D. and 2000 A.D. (6,100,000,000).

$6{,}100{,}000{,}000 = 200{,}000{,}000\ e^{k(1999)}$	plug in the figures; the greater time period involved, the more accurate the estimation (as various trends of population growth will be compensated for)
$30.5 = e^{k(1999)}$	divide by 200,000,000
$\text{Ln}\ 30.5 = \text{Ln}\ e^{k(1999)}$	Log both sides
$0.001709718 = k$	solve for k

$100 = 200{,}000{,}000\, e^{(0.001709718)t}$	plug in figures to determine when (t) there were 100 people on this earth
$1/2000000 = e^{(0.001709718)t}$	divide both sides by 2,000,000
$\text{Ln } 1/2000000 = \text{Ln } e^{(0.001709718)t}$	Log both sides
$-8486 = t$	t is approximately 8500 B.C.

Whereas, I believe that this is an excessive length of time, as I question the population figure at 1 A.D., we are simply looking for an estimation. Go to any website that you want, use any figures that you want, and follow through with these calculations.

The figures I used suggest that the world population began about 11,000 years ago. Even though you can manipulate figures and get a longer or shorter period of time, bear in mind that evolution is based upon many, many generations of man changing and mutating into modern man. Even if you can increase the time period to, say, 50,000 years ago, you are then dealing with a very, very slow population growth. That is, fewer people stretched out over a longer period of time. Increasing the time frame, decreases the number of actual people born in any given year, decreasing the chance that there will be physical and mental improvements over that time. Let me see if I can restate this, as it is am important but subtle point: we can both manipulate figures to shorten or lengthen the time that man has been on this earth; however, the statistical probability for there to be improvements in the population of man remains roughly the same. That is, the chance of having a good mutation result in my time frame of 11,000 years is roughly the same as there being a good mutation over an estimation of 50,000 years. When you increase the time, you must simultaneously decrease the actual number of people that we are dealing with.

People have difficulties in dealing with large numbers. That is, even though modern man began, according to evolutionists, 1,000,000 years ago, many people cannot really distinguish this figure from 50,000 years ago (which is a high end estimate). 1,000,000/50,000 = 20; this means that, let us just assume for a moment, there was a great world catastrophe 50,000 years ago which wiped out the population of the earth (which some do believe); this still means that, the world population would have to start with a handful of people, build up to today's population, and then get destroyed almost entirely 20 times in order for us to place the birth of modern man 1,000,000 years ago. That means, we should find at least 20 worldwide destruction events in our geological history.

Now, if we do not allow the population of man to grow to today's size 20 times, then this will increase the number of world catastrophes considerably. That is, we might be looking at 100–500 world wide catastrophes over that same period of time in order to justify modern man being on this earth for 1,000,000 years. If you read the literature of evolutionists, this runs contrary to their theories of few if any world-wide catastrophes.

The point of all this is, mathematics does not back up the suppositions of evolutionists.

Now, since I have presented this approach to a number of evolutionists, I receive the same response—a very emotional outburst, calling me simplistic, questioning my mathematical ability (this is high school Algebra II or Pre-Calculus mathematics), and saying that the equation and/or results cannot possibly be correct. The reason it cannot possibly be correct is, it is not in agreement with evolution. However, I am given several reasons—there are just too many complex factors, births, deaths, diseases, and unknowns to even attempt such an approach. I agree that there are complex factors here at work and there are unknowns. This is why this equation gives us an estimation, and this is why the estimated time frame is so large. My students, when applying this equation, using whatever data they saw fit, found that man was anywhere between 2000 years old to 25,000 years old. Since I know better how to play with the data, I managed to extend man's time on this planet to 50,000 years. That is a large margin of error, from 2000 to 50,000. That is because, this is an *estimate*. However, to assert that my figures must be 950,000 years off reveals a clear evolutionary prejudice. This asserts that the highest estimate is 1900% off. Such an assertion ignores the concepts of mathematical modeling entirely and holds desperately onto evolution as it is presently presented as the only possible explanation.

Let me offer you an analogy, which will not prove anything; it will illustrate what is going on here. Let's say I ask you, "How much money is in my pocket?"

And you'll answer, "I don't have any idea whatsoever. I don't know how much money you make, I don't know your spending habits, I have never seen your banks statements. There are way too many complex factors for me to give you an answer."

"That's fine; now, guess how much money I have in my pocket in cash and coin."

"For the reasons I stated, I cannot guess."

So I probe you to take some sort of stand. “You mean, you cannot give me a high end or a low end estimation? You cannot use your power of reasoning to do even that?”

“Okay,” you relent. “You might not have any money in your pocket. And, I’ll just make a guess—you probably don’t have more than $50,000 in cash in your pocket. After all, how could that much money even fit into a pocket? So, I will guess between no money and $50,000.”

And I would have to agree that would be a reasonable estimate—those would be reasonable high and low end estimates. I daresay, whoever is reading this right now, you have between nothing and $50,000 in cash in your pocket. That is a reasonable estimate.

Now, if I was to come back at you and say, “Sorry, you’re wrong; I have a million dollars in my pocket” you would know that is ridiculous. If you have any idea as to the size and weight of $100 bills, my asserting that I have $1,000,000 in my pocket is a mathematical impossibility, regardless of my spending habits, salary, bank accounts, etc.

However, an evolutionist will take a time honored mathematical model, and because he knows that evolution must be right, and he knows that anything which asserts the contrary must be smoke and mirrors; he must conclude that man’s time on this earth is a million years; mathematics and mathematical modeling be damned.