

Peopling the New World-An Archaeological Exercise in Excel

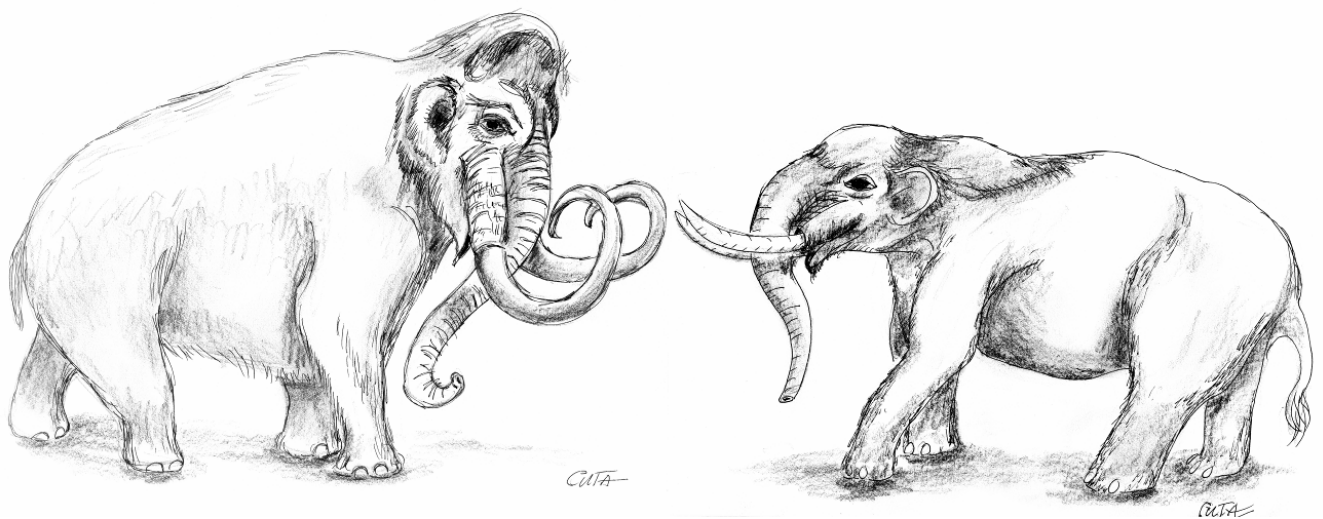
Background



Archaeologists know that the first people to enter the New World came over from Siberia some time around 12,000 years ago. At this time, much of northern North America was covered with glaciers. The people would have hunted many large animals such as elk and moose, as well as mastodons and mammoths that have since become extinct. The people didn't live in one place for more than a few weeks or months at a time. They would have followed the herds of animals that were their food. They made distinctive spear points that allow archaeologists to recognize their culture. These points are called Clovis points, or fluted points. Here is a picture of one of these points.

Within 1000 years, these distinctive spear points are found throughout the New World, from Alaska to the southern tip of South America. We don't know how many people first came across the Bering Strait into Alaska and the New World. But we know that

the bands were small. We can assume that a single band may have been about 24 people, maybe 4-5 families, each with two parents and 3-4 children. How could only a few people have spread so far, so fast, to populate two continents so quickly? How fast did their population have to grow to populate two continents?



A Mammoth and a Mastodon.

Name: _____

Data Exploration

We can explore some different schemes and see what happens with population over this time span. We'll use Excel to create formulas and carry out the calculations. Please complete the answers below, and submit this and your Excel spreadsheet to the D2L digital dropbox for Algebraic Reasoning-Interdisciplinary Lesson.

1) How many generations would have existed over the course of 1000 years (assume 25 years per generation)?

2) How might the population change after one generation? If there were 24 people to start, how might the population grow after 1 generation? What different scenarios can you think of to explain how the population might increase?

3) Let's suppose the population increases. If there were 24 people to start, how many might exist after 1 generation (choose one scenario from question #2)?

4) If you use the numbers in #3, what is the growth factor?

5) Use your growth factor in #4. How many people would there be after one generation? After two generations? After three generations?

After one generation _____

After two generations _____

After three generations _____

6) Use Excel to show what the populations are after one generation, two generations, and so forth, up to 40 generations. (Excel has an auto-fill feature that comes in handy here). How many people are there after 40 generations?

7) Change the growth factor in your spreadsheet. What happens to the projected population after 40 generations?

Growth Factor _____ Population after 40 generations _____

8) Change the estimated size of the initial population. What happens to the projected population after 40 generations?

Initial Population _____ Growth Factor _____

Population after 40 generations _____

9) Do you think a band of 24 people could have populated the New World in 1000 years?

Optional

10) What do we mean that the New World is “populated”?

11) One way to decide if the New World is populated is to find the “population density”. We compute this by dividing the number of people by the area of the land they live in. This tells you, on average, how many people live in each square mile (or each square kilometer). The area of the “New World” is about 42,000,000 square kilometers or 16,000,000 square miles. Use the information in #8 to find the population density.

Population density as people per square kilometer _____

Population density as people per square mile _____

12. How could you graphically illustrate the population growth? Use Excel to create an appropriate graph showing population increase over 40 generations. Copy the graph from Excel and paste it here.

Further Discussion:

Could the growth factors you used above be reasonable for a span of 12,000 years (or 3,000 generations). How many people would there be today if you used those growth factors?

Useful facts:

How big is North America? 24,229,000 Km²; or 9,300,000 square miles

How big is South America? 17,612,000 Km²; or 6,800,000 square miles

Current population densities: USA: 29.77 people/square kilometer

Wisconsin: 38.15 people/square km

North Dakota: 3.59 people/square km

Further Information:

Consider how many people are in the world today:

<http://www.census.gov/cgi-bin/ipc/popclockw>

What is the current rate of population increase, world-wide?

http://www.npg.org/facts/world_pop_year.htm

What is the population density today? Here are figures for different countries

http://www.photius.com/wfb1999/rankings/population_density_0.html

For information about population density, and lesson plans on geography

<http://www.nationalgeographic.com/xpeditions/lessons/01/g912/density.html>

For more information about the first people in the New World, see the discussion about Paleo peoples at the MVAC Pre-European Cultures web site:

http://www.uwlax.edu/mvac/PreEuropeanPeople/EarlyCultures/paleo_tradition.html