

“Large” Numbers

Problem 1:

Every year since 1970, the number of American children gunned down has doubled.

Those leaning left may use this statement to support tighter gun regulation (e.g., there are too many guns on the street). On the flipside, those leaning right might claim that all of this violence implies we need *more* guns for protection. Thus, the statement may be used to support either position.

When you begin completing the table, it becomes clear there is something wrong with the statement. Say we start with 1 child gunned down in 1970:

Year	Number of Children Gunned Down	Rounded (in words)
1970	1	
1971	2	
1972	$2^2 = 4$	
1973	$2^3 = 8$	
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1980	$2^{10} = 1,024$	one thousand
1990	$2^{20} = 1,048,576$	one million
2000	$2^{30} = 1,073,741,824$	one billion
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Given the world population is 7.5 billion, something is clearly amiss! As we discussed in class, you can model the above with $y = 2^x$ where x = the number of years since 1970 and y = the number of children gunned down

or

$y = Q \cdot 2^x$ where x and y are defined as above and Q stands for the number of children gunned down in 1970 (in the table, notice that $Q = 1$).

PROBLEM

The planet Venus is about 67 million miles from the sun. Assuming that its orbit is approximately circular, how far does it travel in one year? (one Venus year, not one earth year).



Source: NASA

