

### In my estimation

Who in your family is closest to being a billion seconds old? Is it one of the children? Or is it mom or dad? Or maybe a grandparent, or even a great grandparent? Are we talking about a few months? a few years? or even a few centuries?

There are  $60 \times 60 = 3600$  seconds in an hour, and so  $3600 \times 24 = 86400$  seconds in a day. In ten days, there are 864,000 seconds, which is 136,000 second short of a million. That's a little over a day and a half worth of seconds. So one million seconds is a little more than eleven and one half days. A billion is a thousand million, so a billion seconds is over 11,500 days.

Now ten years is about 3650 days, so thirty years is about 10950 days, a little less than 11000. So we can conclude that one billion seconds is about thirty-one and a half years. With a pocket calculator, we could find out the exact number of days and so determine on which day a given person is one billion seconds old. Some readers of the *Frontenac News* may have reached the three-billion second mark; perhaps they deserve special recognition. (Note that a trillion is a thousand billion, which in seconds corresponds to an age several times as long as all of human recorded history – something to think about when contemplating the American national debt.)

An interesting pastime is to pose these sorts of odd problems that lend themselves to rough calculations, often requiring assumptions on which to base them. Such problems are named after the famous physicist, Enrico Fermi (1901-1954), who was known for them. A famous example was to obtain an estimate of the number of piano tuners in the city of Chicago. Such questions became popular in education circles, and teachers were encouraged to use them particularly with their middle school classes to help pupils gain mathematical fluency. See for example

<https://www.edu.gov.on.ca/eng/studentsuccess/ims/files/FermiProblems.pdf>.

Here are some for you to think about. I would like to receive your estimates; be sure to state clearly what assumptions you need to arrive at the result. It would be interesting to see to what extent people agree. You may have your own questions to share with the readers.

1. Jeff Green has published many editorials and reports in the *Frontenac News*. How many of his words appeared in the newspaper during 2015? If we were to write his words in letters two inches high along the shoulder of Highway 7, beginning at the Sharbot Lake intersection and heading towards Ottawa, where would we end up?

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2. How many months did your grandmother spend brushing her teeth?
3. How many cats are there in Central Frontenac Township?
4. What percentage of all the people who have ever lived are alive now?
5. How many litres of water are there in Sharbot Lake?
6. How many logs are there in a cord (128 cubic feet) of wood?