

## 1.7 Exponential Problems Day 2

Augustus is generally selfish and somewhat unpopular at school. He decides that he could improve his image by sharing his candy with everyone at school. When he has a pile of 100,000 candies, he generously plans to give away a portion of the pile.

Plan 1: He generously plans to give away half of the candies that are in a pile each day.

Plan 2: He generously plans to give away 60% of the candies that are in a pile each day.

Plan 3: He generously plans to give away three quarters of the candies that are in a pile each day.

Augustus doesn't feel like he wants to be quite so generous anymore. He wants to make sure that after 10 days, he still has at least half of his candy left. What should he plan to do to make sure this happens?

Modified Lessons from MVP: <https://www.mathematicsvisionproject.org/>

1. Find a bank account balance if the account starts with \$100, has an annual rate of 4% interest, and the money is left in the account for 12 years.
2. In 1985, there were 285 cell phone subscribers in the small town of Centerville. The number of subscribers increased by 75% per year after 1985. How many cell phone subscribers were in Centerville in 1994?
3. Bacteria can multiply at an alarming rate when each bacteria splits into two new cells, thus doubling. If we start with only one bacteria which can double every hour, how many bacteria will we have by the end of one day?
4. Each year, the local country club sponsors a tennis tournament. Play starts with 128 participants. During each round, half of the players are eliminated. How many players remain after 5 rounds?
5. The population of Winnemucca, Nevada can be modeled by  $P(t) = 6194(1.04)^t$ , where  $t$  is the number of years since 1990. What was the population in 1990? By what percent did the population increase by each year?
6. During normal breathing, about 12% of the air in the lungs is replaced after one breath. Write a model to represent the amount of the original air left in the lungs, if the initial amount of air in the lungs is 500 mL. How much of the original air is present after 240 breaths?
7. An adult takes 400 mg of ibuprofen. Each hour, the amount of ibuprofen in the person's system decreases by about 29%. How much ibuprofen is left after 6 hours?

<https://1.cdn.edl.io/g4UrCzd3cENlcRnwmQ5eACmVYS0lqWCjucTiMlCVZ2IP1H6a.pdf>