**Solving the Drake Equation**

1. The Drake equation is: N = R\* fp ne fl fi fc L

What does the N stand for?

Instinctively, what do you think is a good estimate for N?

1. What two values do we actually know?

What is a good estimate for ne, the number of planets in a star’s habitable zone?

1. Let’s estimate the other values.
   1. fl is the fraction of planets that could support life that actually develop life at some point. For example, if you said ne = 3, and only 1 of those actually develops life, then fl = 1/3 = 0.33. Estimate fl and explain your reasoning.
   2. fi is the fraction of planets with life that actually develop *intelligent* life. First, define what intelligent life is:

Next, estimate fi. For example, if you think 50% of planets with life go on to develop intelligent life, then fi = 0.5.

Think about the fact that life on Earth seems to require a large Moon. Also, if a meteorite hadn’t wiped out the dinosaurs, humans would not have evolved (although something else could have….). Do you think these circumstances are rare? How does this change your estimation of fi?

* 1. fc is the fraction of civilizations that develop a technology that releases signs of intelligent life into space. Use your knowledge of different civilizations as well as different intelligent species (like apes) to estimate this fraction (again, a fraction is between 0 and 1, so if you think 10% of intelligent life develops advanced communication, then fc = 0.1).
  2. L is the length of time, in years, that a civilization releases detectable signals into space. Estimate L (our radio age began in the 1930s) and explain your reasoning.

1. Now, multiply all of your numbers together to get N.
2. Is N lower or higher than you expected? What did you expect? How does this make you re-evaluate life on Earth?
3. There are many flaws with the Drake Equation. Do you notice any? How would you modify this equation?