

## The JETS Challenge

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### Challenge 85 – The Red Blood Cell Challenge

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**Problem:**

The average human body produces 2 million red blood cells every second. Assume the world population is 6.5 billion people.

**How many days will it take the world's population to produce  $6.02 \times 10^{23}$  (Avogadro's number) of new red blood cells?**

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**Solution:**

2,000,000 red cells/second

6.5 billion population

So, # cells per second for population

$$= 2,000,000 \times 6,500,000$$

$$= 13,000,000,000,000,000$$

$$= 1.3 \times 10^{16} \text{ cells/second}$$

$$1 \text{ min.} = 60 \text{ sec.}$$

$$1 \text{ hr.} = 60 \times 60 = 3,600 \text{ sec.}$$

$$24 \text{ hrs.} = 24 \times 3,600 = 86,400 \text{ sec.}$$

# cells per day

$$= (1.3 \times 10^{16})(86,400)$$

$$= 1.1232 \times 10^{21}$$

$$\frac{6.02 \times 10^{23}}{1.1232 \times 10^{21}} = 535.97$$

or 536 days