

## Heart Beats Activity - Example

- Measure # heart beats in 1 min - 3 trials

Trial #	1	2	3
# heartbeats	60	70	80

- Average # =  $\frac{60 + 70 + 80}{3} = 70$  beats for 1 min

• # of heartbeats per life time, assuming that I will live 80 years, and the average of number of heartbeats will stay the same through my entire life

$$\frac{\# \text{ heartbeats}}{\text{life time}} = \frac{70 \text{ beats}}{\text{min}} \cdot \frac{60 \text{ min}}{1 \text{ h}} \cdot \frac{24 \text{ h}}{\text{day}} \cdot \frac{365 \text{ day}}{1 \text{ year}} \cdot 80 \text{ years}$$

There are 2 ways to estimate the orders of magnitude in examples like this.

- The most precise one is by doing the calculations and apply log to your final answer

or

- you estimate the OM of each factor, you multiply them and you obtain the final OM.

- Calculating: 2943,360,000, then OM:  $10^{10}$
- OMs for each factor:  $10^2 \cdot 10^2 \cdot 10^2 \cdot 10^3 \cdot 10^2 = 10^{11}$