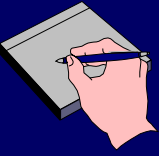


Example



Space Travel

Alpha Centauri is 4.3 light-years from earth. (It takes light 4.3 years to travel from earth to Alpha Centauri).

How long would people on earth think it takes for a spaceship traveling $v=0.95c$ to reach Alpha Centauri?

$$\Delta t = \frac{d}{v} = \frac{4.3 \text{ light - years}}{0.95 c} = 4.5 \text{ years}$$

How long do people on the ship think it takes?

People on ship have 'proper' time. They see earth leave, and Alpha Centauri arrive in Δt_0

$$\Delta t = \frac{\Delta t_0}{\sqrt{1 - \frac{v^2}{c^2}}}$$

$$\Delta t_0 = \Delta t \sqrt{1 - \frac{v^2}{c^2}} = 4.5 \sqrt{1 - .95^2}$$

$$\Delta t_0 = 1.4 \text{ years}$$