

the mass-luminosity relation

If we now consider just the (very few) main-sequence stars for which accurate masses are known, it is found that there is a *mass-luminosity* relation, which is illustrated in [figure 3](#). The mass-luminosity relation tells us that the more massive a star, the more luminous it is. The luminosity increases with, on average, the fourth power of the mass, $L_s \propto M_s^4$, and the slope appears to be somewhat less steep for both more massive and less massive stars. Hence if we move along the main sequence on the HR diagram from bottom to top, we find that the stars gradually increase in mass. Like the HR diagram, this is a relation which we must hope to understand theoretically.

Figure 3: Schematic mass-luminosity relation for main sequence stars.



