In a wide range of athletic events males would be expected to outperform females at the elite level of competition (Shephard, 2000). Measurements of physiological, anatomical, and biomechanical attributes of male and female athletes reveal likely explanations for these performance differences. This brief article will use demonstrated sex differences in physical characteristics to make sense of performance differences between first-placed males and females from recent world championships in swimming and running. The task challenges the human biology student to connect physiological and anatomical principles to aspects of human function with which they can readily relate.

Recent studies have identified salient differences between male and female athletes in aspects of energy metabolism, cardiorespiratory function, body composition, and body proportions. Considering energy-releasing pathways, there is evidence of higher concentrations of succinate dehydrogenase (a Krebs Cycle enzyme) in male skeletal muscle (Costill, Fink, Flynn & Kirwan, 1987) and greater maximal lactate concentrations after all-out exercise among males (Tarnopolsky, 1999). Larger heart volume, hematocrit, and plasma volume (Shephard, 2000) favor males in those events limited by the rate of aerobic energy release. Relatively higher absolute