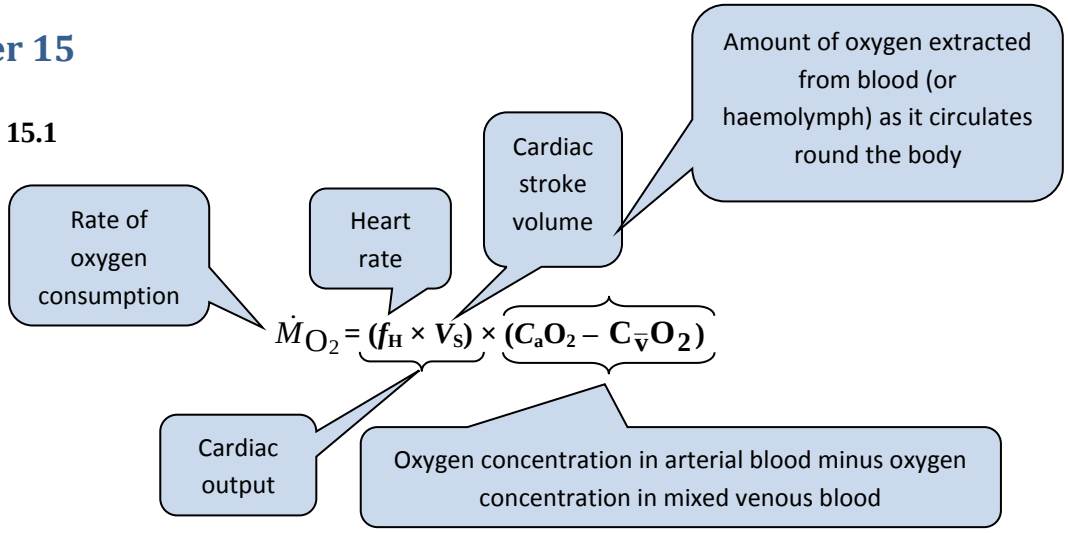
Chapter 15

Question 15.1



Cardiac output increases 8-fold above its resting value, but heart rate by only 6-fold, so cardiac **stroke volume increases by $\frac{8}{6}$ = 1.33-fold**

Rate of oxygen consumption increases by 15 times, but cardiac output only increases by 8 times. Therefore the amount of oxygen extracted from the blood, **($C_aO_2 - C_{\bar{v}}O_2$), increases by $\frac{15}{8}$ = 1.87 times**

Question 15.13

The volume of the lungs in the 50 kg sea lion is 50 × 50 = 2500 mL

Hydrostatic pressure increases by 1 atmosphere for every 10 m of descent into the water column. So, at a depth of 70 m, the total pressure acting on the lungs is 8 atmospheres (7 atmospheres of hydrostatic pressure plus the 1 atmosphere at the surface) and their **volume would be $\frac{2500}{8}$ = 312.5 mL**