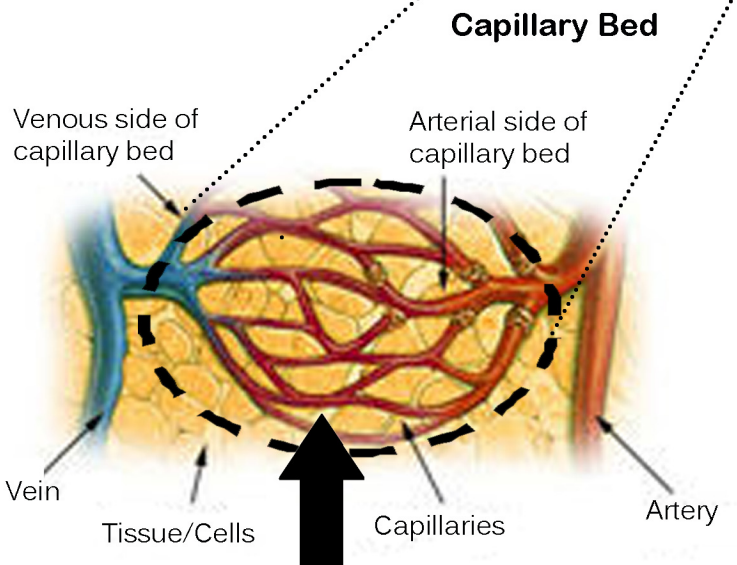
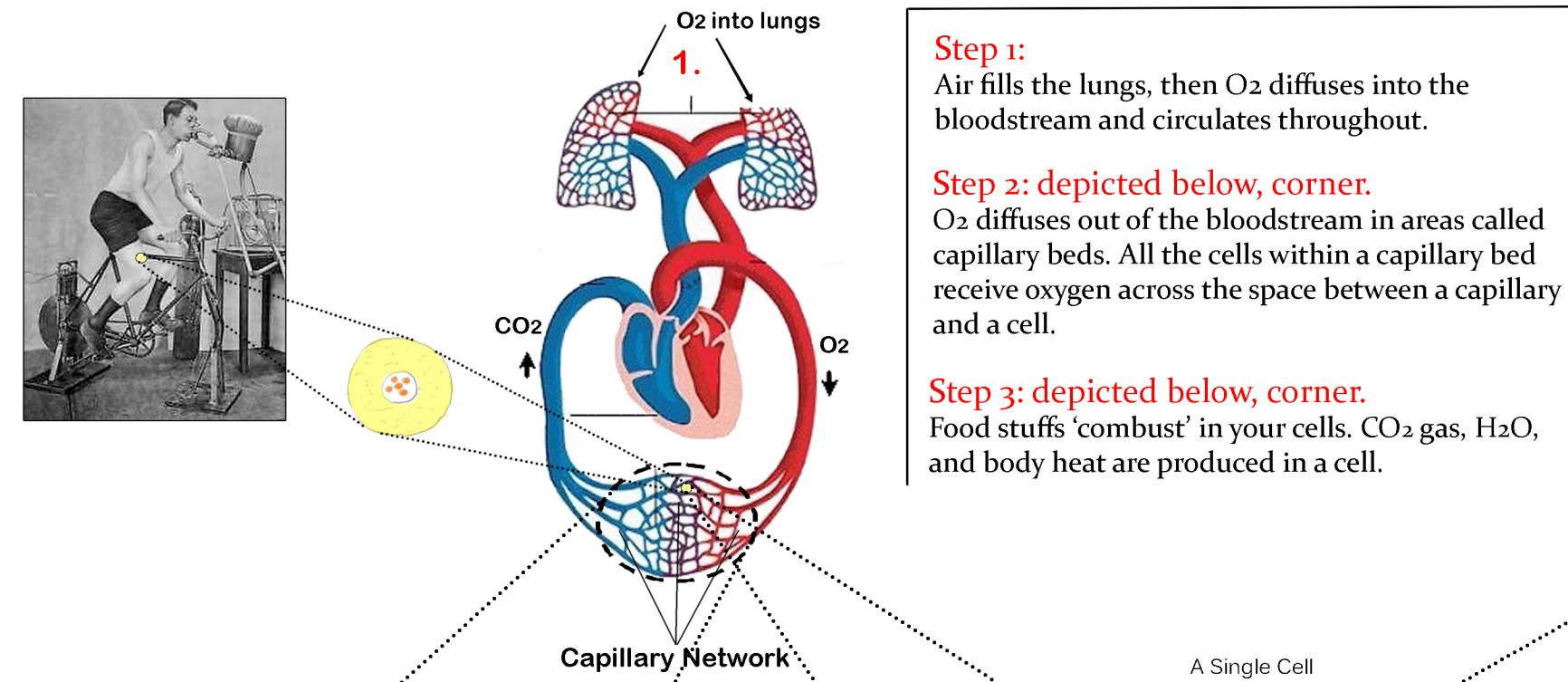


This page illustrates combustion in a single cell

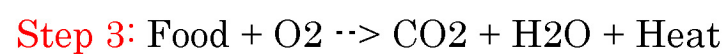
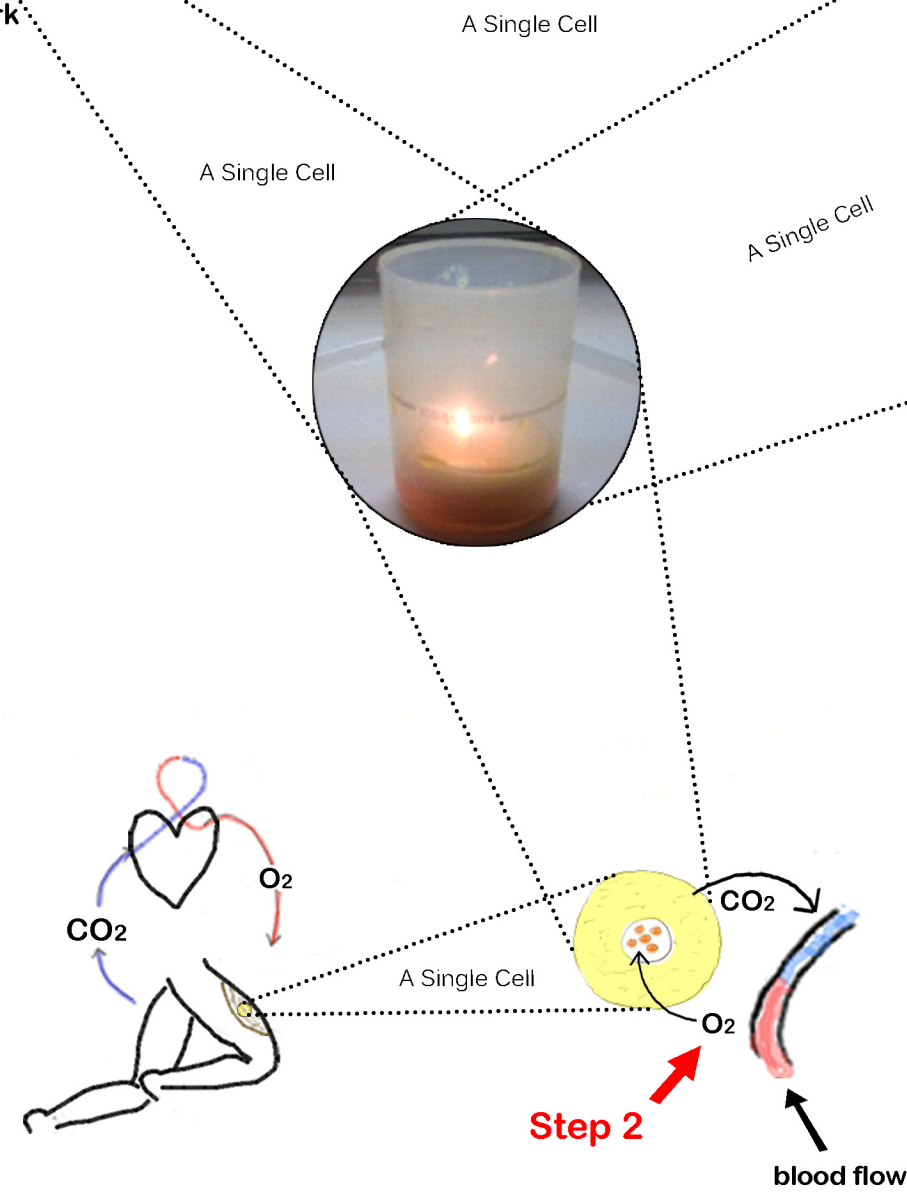


This is the area in your body where combustion (aka respiration) occurs. O₂ constantly diffuses out of arterial capillaries into the cells and CO₂ respired back into the venous side of the capillary bed.

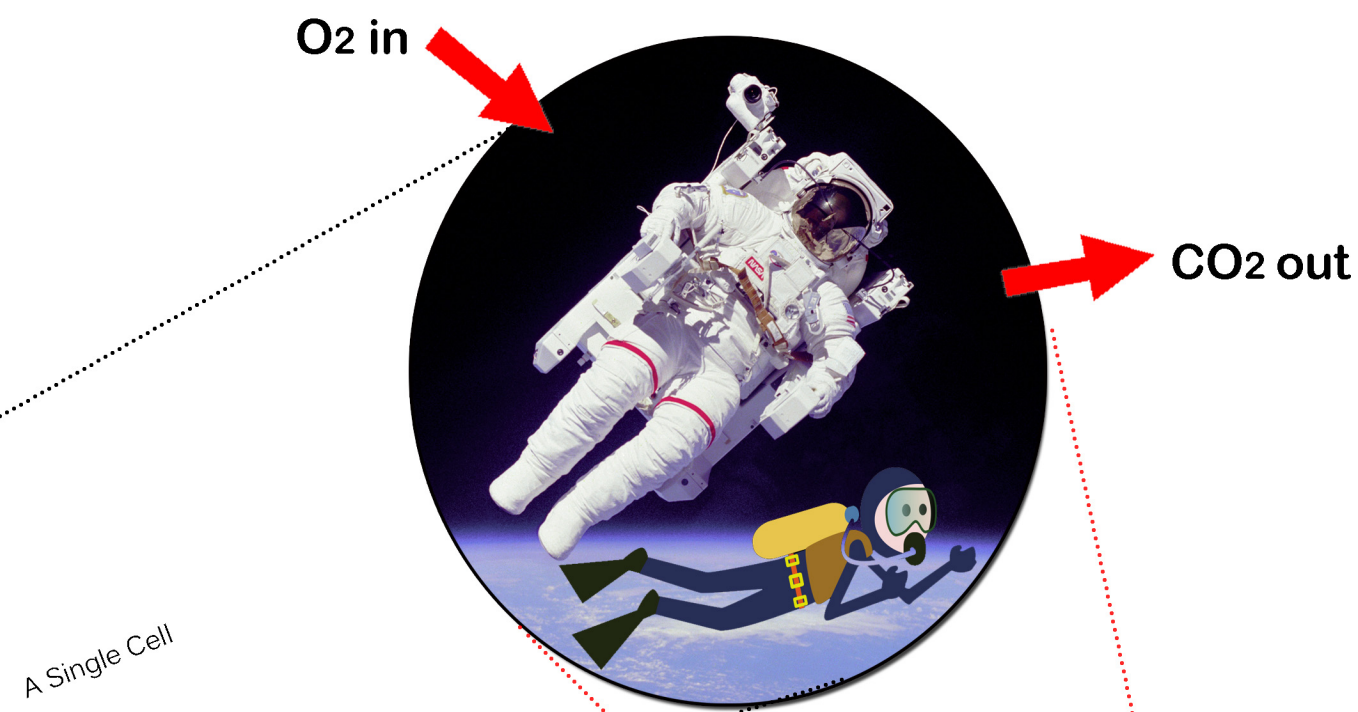
We need a microscope to see cells.

Arterial blood (colored red) is oxygen rich blood that flows away from the heart into capillary beds.

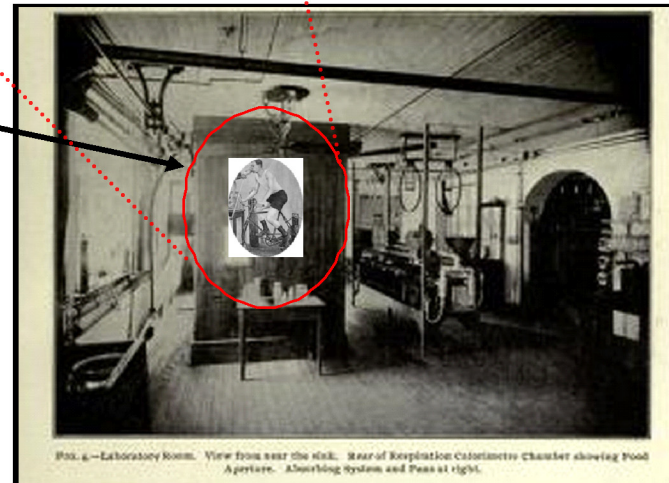
Venous blood (colored blue) is oxygen depleted blood which contains CO₂ gas from the combustion of food stuffs in your cells and flows back to the heart.



If your entire body is contained and sealed off (like a single cell in your body) then your entire body becomes one single, gigantic cell. In a sealed space, it is now necessary to 'pipe in' an O₂ supply for entry into your lungs. CO₂ must exit through an exhaust valve.



This sealed room is a cell; it is a singular, sealed place where O₂ is consumed and CO₂ is released, **but this is a result of all the cells collectively within the man consuming O₂ and expiring CO₂.**



PICTURED RIGHT:

A known volume of O₂ is measured as it is released into the room similarly to the way an astronaut or scuba diver consumes a known volume of O₂ out of an oxygen tank of known volume.

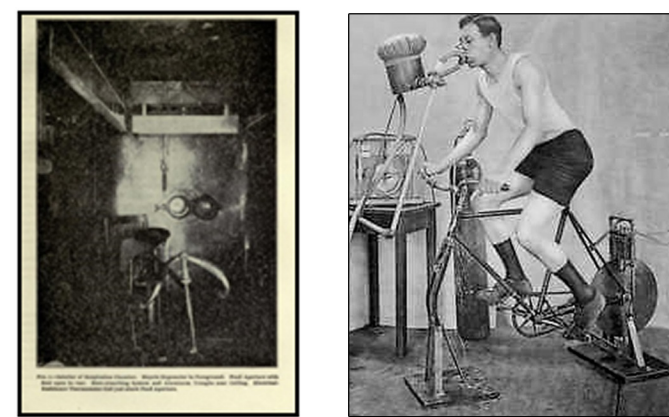
All the CO₂ released (and collected) out of the room is equal to the volume of CO₂ expired collectively from the man's cells, (exhaled out his mouth).

Within the room, there is no need for the man to wear a mouthpiece! Man and room together are one cell.

A future lesson teaches how we can calculate the amount and type of fuel substrate (fat or carbs) burned by the body - based on comparing the volume of CO₂ released to the volume of O₂ consumed.

The 'physical rules' of fire, i.e. the chemistry of combustion will make this easy to understand.

Fuel + O₂ → CO₂ + H₂O + HEAT



"Without the ability to measure O₂ consumption and fuel substrate used, describing and quantifying metabolism and caloric demand would be impossible. Many processes that explain what makes a body 'healthy' or 'unhealthy' would not be known." Ed Watson