

*Why Surface Area to
Volume Ratio
(SA:V)
is Important in Biology*

SA:V is incredibly important for survival

The larger the SA:V ratio, the more ANYTHING can cross the cell membrane. Hugely important because:

- Water
- Oxygen
- Carbon dioxide
- Waste products
- And many other substances that we need to survive

So high SA:V can be positive or negative, depending on the situation

Mitochondria Structural Features

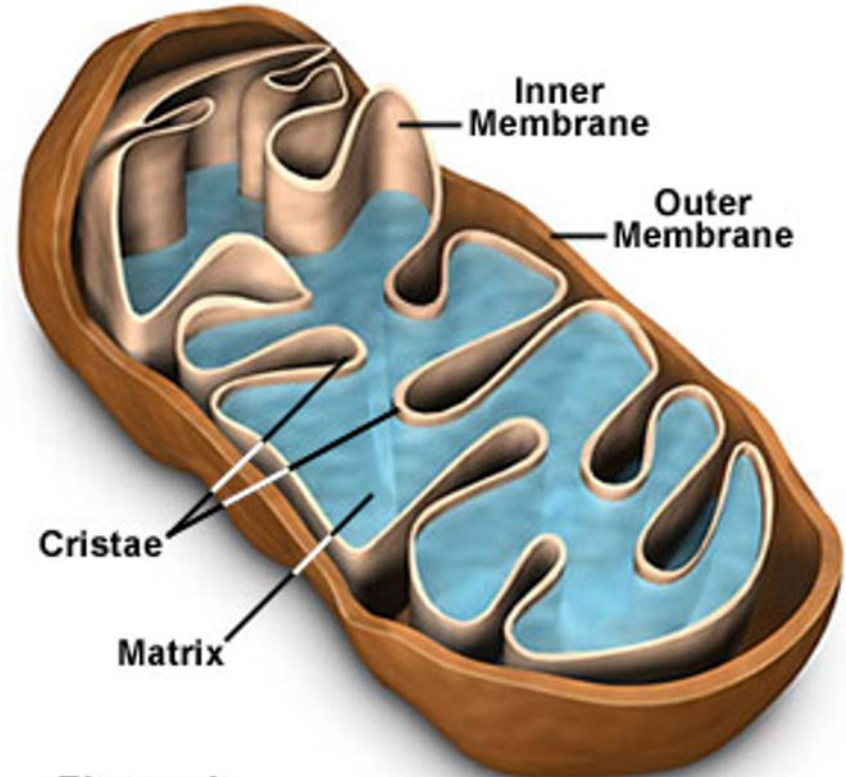
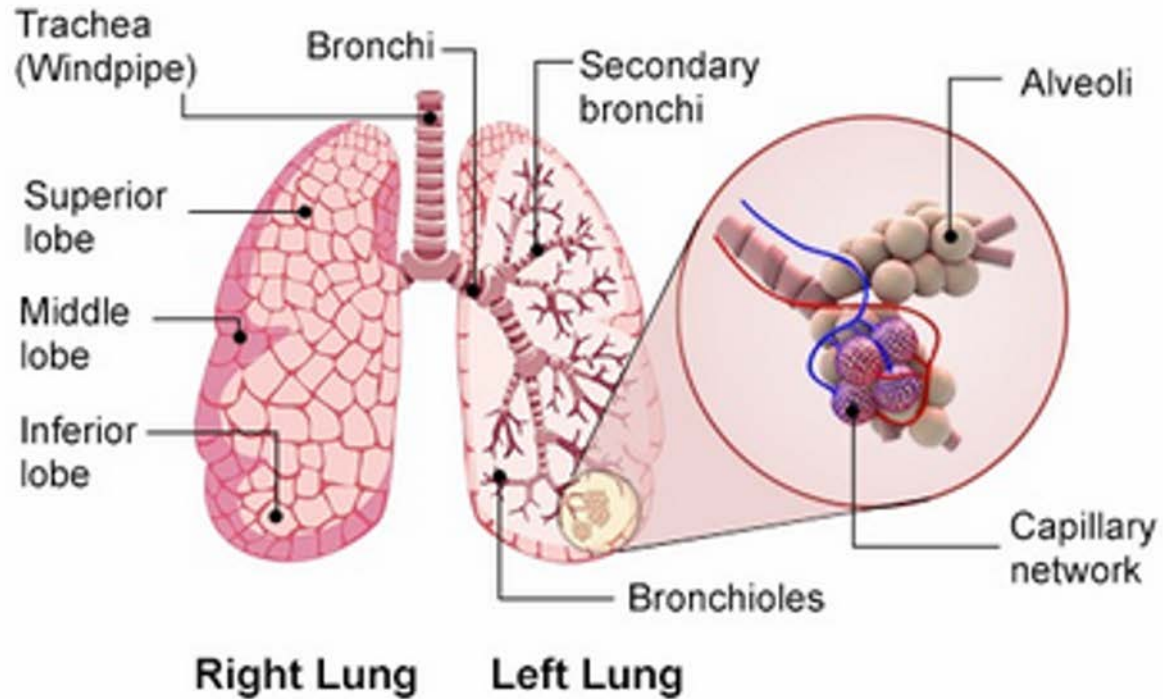
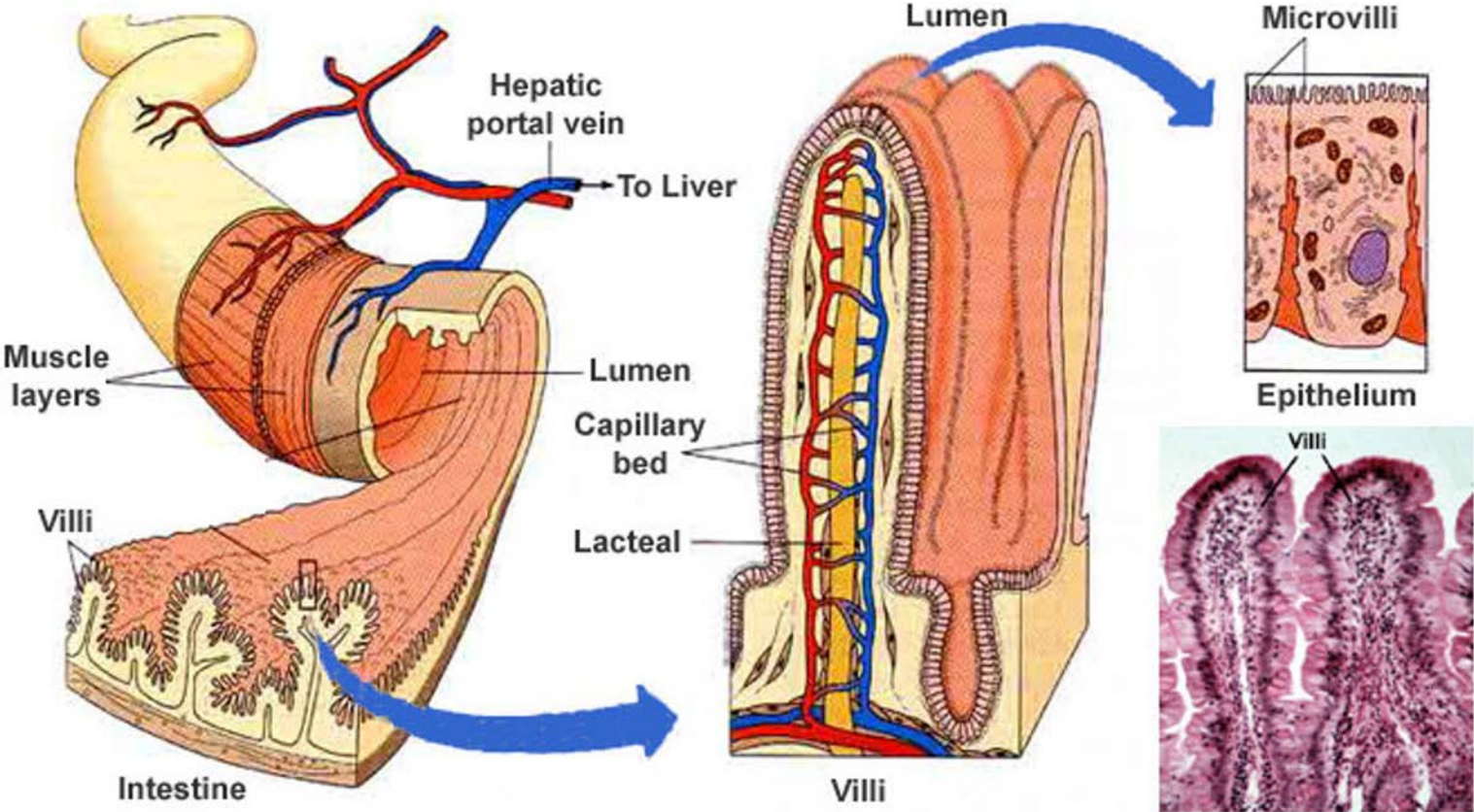


Figure 1

SA:V is incredibly important for survival

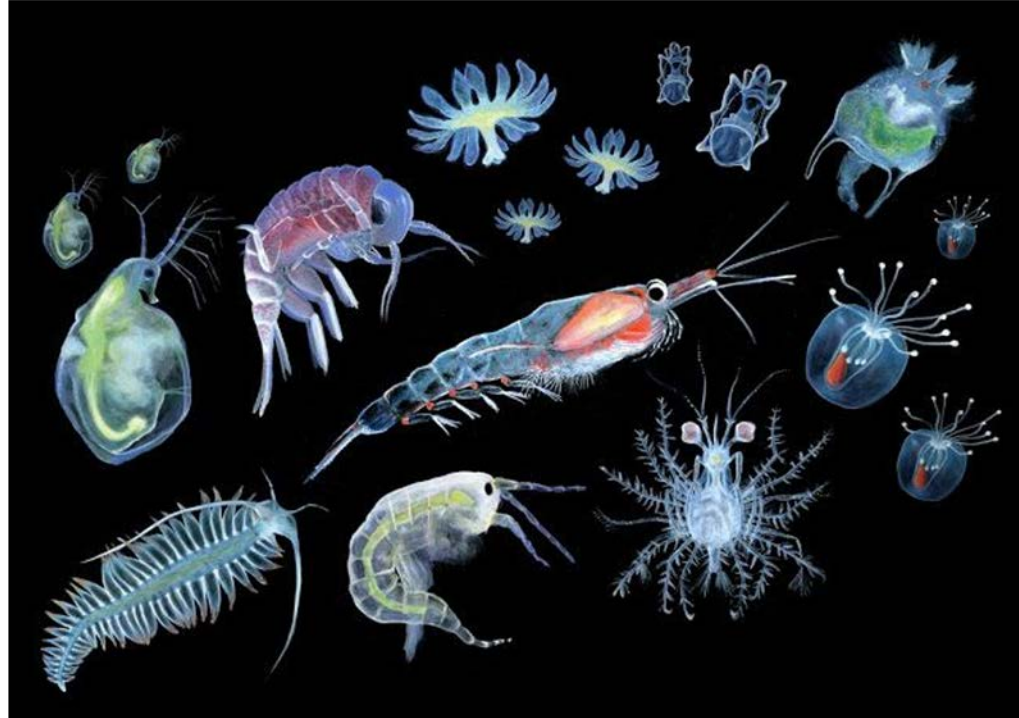


SA:V is incredibly important for survival

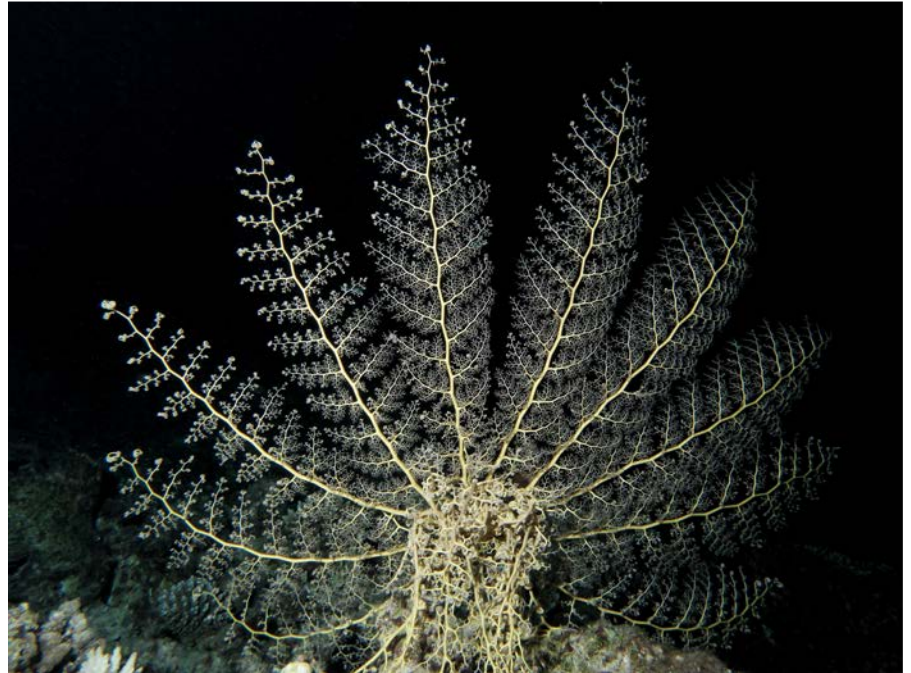
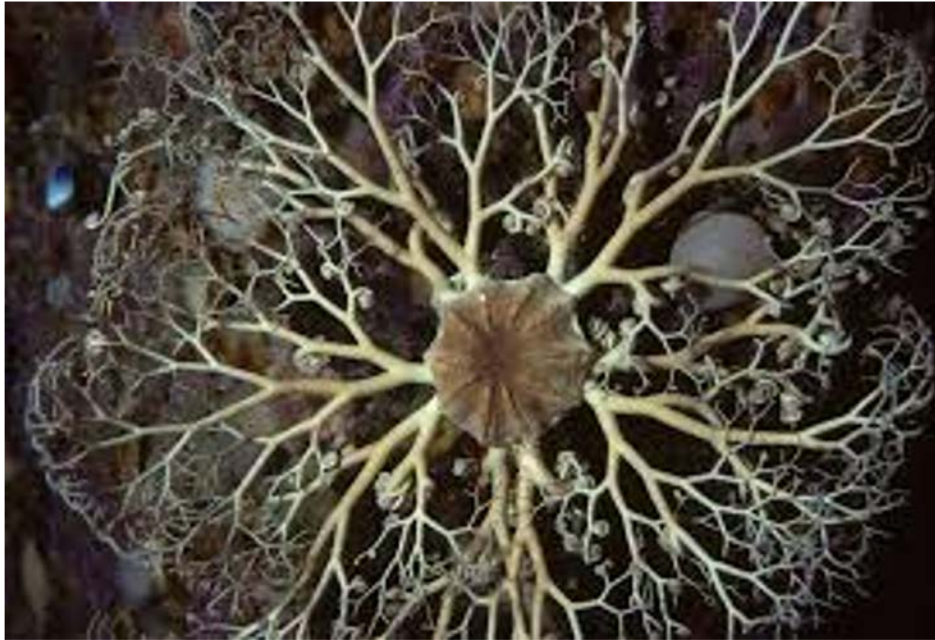


Marine Organisms

- ❖ Many plankton increased surface area to increase their drag in the water.
- ❖ This reduces their rate of sink and allows them to remain near the surface with less energy expenditure.



Obtaining food & oxygen - higher SA:V is better



Marine Organisms

- ★ An increased surface area to volume ratio also means increased exposure to the environment.
- ★ The finely-branched appendages of **filter feeders** such as **krill** provide a large surface area to sift the water for food.



Marine Organisms

- ★ This is a Green Sea Anemone - notice the bumps on the body
- ★ Compare that to the smooth body of the Plumose Sea Anemone
- ★ Why the difference?

