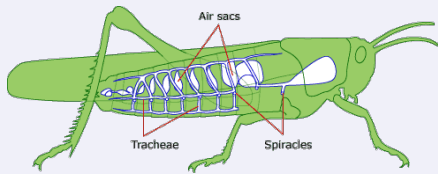


### Mammals

### Fish

### Insects



### Key Factors/Parts and Descriptions (cont)

|                            |                          |
|----------------------------|--------------------------|
| Fluid along the tracheoles | Increases diffusion rate |
|----------------------------|--------------------------|

### Key Factors/Parts and Descriptions

|                        |                                                                                                                                                   |
|------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| Spiracles              | opens and closes to minimize water loss. Air intake in through the thorax. Air output through the body.                                           |
| Hairs around spiracles | Traps humidity to minimize water loss. Allows to keep a lower concentration gradient of water vapor so that the rate of diffusion is not so high. |
| Trachea                | The major tube that runs along the length of the insect.                                                                                          |
| Tracheoles             | A very thin tube that squeezes between individual cells.<br>Lacks Chitin                                                                          |
| Air Sacks              | Present in larger insects. Inflates and deflates to help movement of air                                                                          |
| Muscular Pumping       | rings of muscles around the trachea squeeze in succession to force air along                                                                      |
| Metabolic Rate         | Relatively High                                                                                                                                   |
| Chiton Rings           | Rings of chiton support trachea.                                                                                                                  |
| Availability of oxygen | 21% O <sub>2</sub> in air                                                                                                                         |
| Surface Area           | Tracheal tubes connecting directly to cells. Massive SA:V ratio                                                                                   |



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