**The Physics of Heat Transfer and how animals regulate their body temperatures.**

Describe the methods of heat transfer

* + conduction
  + convection
  + radiation
  + evaporation

Explain how adaptations are used to regulate body temperature in endotherms and ectotherms.

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|  | **Physical Principles Radiation**  **Heat travels through space from the surface of a \_\_\_\_\_\_\_\_\_\_\_\_\_ body to the surface of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ body** |
|  | **Radiation**  **The greater the surface area of a body, the greater the radiation.**  **Small animals have a \_\_\_\_\_\_\_\_\_\_\_\_\_**  **surface area to volume ratio than \_\_\_\_\_\_\_\_\_\_\_\_\_ animals.**  **Small animals radiate heat more \_\_\_\_\_\_\_\_\_\_\_ than large animals.**  **\_\_\_\_\_\_\_\_\_\_\_\_ is a better absorber of radiation and a better radiator than \_\_\_\_\_\_\_\_\_\_\_\_\_\_** |

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|  | **Physical Principles Conduction**  **Heat flows from \_\_\_\_\_\_\_\_\_ to \_\_\_\_\_\_\_\_\_.**  **Conduction occurs when an animal is in contact with a surface like** |
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|  | | **Counter Current Exchange** | |
|  | **Convection**  **Hot air \_\_\_\_\_\_\_\_\_\_\_ away form a hot body.**  **Convection may be controlled by structures such as \_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_ ,**  **\_\_\_\_\_\_\_\_\_\_\_\_\_ which trap warm air. When hairs erect or stand up it is called pilo erection.** | |
|  | Evaporation  Sweating involves \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of water from the skin surface and removes \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ from the body as liquid water turns to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ . For sweating to be effective the air must be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | |

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