

**Question: How does clothing worn in cold weather retain body heat?**

Since hot air is made up of particles moving quite quickly compared to particles moving slowly in cold air clothing will be of a type that restricts heat loss due to conduction, convection and radiation.

**Conduction:**

Conduction is the movement of heat by direct contact with clothing fibres. To reduce conduction we use fibres that have a low conductivity to heat. Merino, polyprop are two such fibres. They conduct slowly and so act as insulators. When clothes get wet then there is more particles to allow for an increase of heat loss by conduction. Wool can get wet but still keep heat in and the wool fibres overlap and so reduce heat loss by conduction. (1)

**Convection:**

Convection is the key way the body loses heat. In convection the air moves and rises and this takes heat away from the body. In clothing the key warming method involves stopping this air movement. This is done by having air pockets trapped in the clothing and the movement of the air is stopped by the fibres. This forms an insulating "blanket" over the body and keeps us warm.(2)

**Radiation:**

Radiation involves heat loss as heat on the electromagnetic spectrum. All hot bodies radiate heat. This form of heat loss cannot be stopped but can be reduced. Wool reduces heat loss by radiation. [3]