

The Physics Of Ferret Cooling

Brush up on your physics to learn how to affect temperature and keep ferrets safe.

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Remember your physics classes in school? Here is a ferret-related refresher.

There is no such thing as “cold.” Cold is just a lower level of heat energy, that is, a lack of heat. Heat always moves from hotter to cooler. Something feels cool or cold to us when heat is being removed from the heat sensors in our skin. The faster the heat is drawn away, the colder it feels. A piece of metal and a piece of plastic might be exactly the same temperature, but the metal feels colder. Why? Because heat conducts (moves) through it more rapidly, so it cools our skin faster.

Heat transfer happens three ways:

#1. By conduction (direct contact). When your ferret lies on a cool surface or next to an ice bottle, it cools itself by conduction.

#2. By convection (heat moving — usually rising — through air or liquid). Because heat rises, it will always be hotter near the ceiling, unless something is circulating the air well enough to mix it perfectly. Keep your ferret close to the floor in hot weather. The cold air flowing off an ice bottle sinks and flows away because it is heavier than warm air that is rising up around it.

#3. By radiation (waves of heat moving through space), like sunlight and the heat you feel from a fireplace. If your attic is not insulated, during the day you will feel a great deal of radiant heat “beating down” on you from above. This kind of heat transfer can be reduced if you insert a reflective surface between your ferret and the source, like shiny, aluminized bubble wrap car sunscreen, or a Mylar “space blanket.” Several shiny layers are more effective than just one.

There is also heat transfer through phase-change potential:

When ice melts (a phase change from solid to liquid), it absorbs extra heat, so it cools you more. That is why we use crushed ice in the carrier bottles in very hot weather. It is actually the fast melting that is providing most of the cooling effect.

When water evaporates (a phase change from liquid to a gas), it feels cool. That is because it has to absorb extra heat to evaporate. But evaporative cooling only works if the humidity is low enough for the water to evaporate readily. And if the humidity is very high, your ferret won't be able to cool itself as effectively from panting, either.

An insulator is something that slows down heat transfer via conduction or convection. The most effective insulation is material that traps air in tiny pockets, like ferret fur. A ferret's fur holds in body heat, but it can also keep out very hot air for a short time.

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