

Australian ectothermic and endothermic organisms essay sample



**ASSIGN
BUSTER**

- ECTOTHERMS are organisms that have a limited ability to control their body temperature. Their cellular activities generate little heat. Their body temperatures rise and fall with ambient temperature changes. Most organisms are ectotherms. Examples are plants, all invertebrates, fish, amphibians and reptiles
- ENDOTHERMS are organisms whose metabolism generates enough heat to maintain an internal temperature independent of the ambient temperature. Examples are birds and mammals
- EXTENSION (Not really needed but anyway...)

Poikilotherms are animals whose body temperatures are always changing. True poikilotherms have temperatures that are the same as the environment. An example is jellyfish. Poikilothermy is often assumed to be the same as ectothermy; however, this is incorrect. Some ectotherms, like snakes, can regulate their temperatures using behaviour to maintain a stable temperature.

Homeotherms are animals with stable body temperatures. Most endotherms are also homeotherms.

The poikilotherm/homeotherm classification system was based on the stability of the body temperature of the organism. This system is now redundant.

The ectotherm/endotherm system uses the organism's source of body heat as a way of classification. This system is accepted today.

- BEHAVIOURAL ADAPTATIONS:

Migration: Animals can move to avoid temperature changes. Many birds that spend spring and summer in Australia migrate before the temperature becomes cold.

Hibernation: To survive cold conditions, many animals hibernate; that is they remain in a sheltered spot, their metabolism slows and the body temperature drops. Aestivation is the 'hibernation' of organisms in heat conditions. Bogong moths migrate to spend the summer months in caves in the Australian Alps

Shelter: Animals seek shelter to avoid extreme conditions. They can dig burrows or seek shelter in caves or crevices. They can shelter to avoid high temperatures or avoid low temperatures. An example is the central netted dragon

Nocturnal Activity: Brown snakes can change into nocturnal animals when the temperature becomes very hot. Many desert animals sleep in burrows during the day and are active at night

Controlling Exposure: Animals can reduce the amount of their body they expose to the sun, to reduce the amount of heat absorbed.

- STRUCTURAL AND PHYSIOLOGICAL ADAPTATIONS:

Endotherms have more structural & physiological adaptations for temperature control than ectotherms. Most ectotherm adaptations are behavioural

Insulation: Fur in mammals and feathers in birds maintain a layer of trapped air as insulation. This air reduces heat exchange with the environment.

Contracting the muscles of the hairs or feathers makes it lift up, increasing the amount of air that can be trapped. Some mammals grow a thick coat in winter and lose it in summer. Animals in cold conditions have a permanent layer of fat as insulation.

Metabolic Activity: In cold conditions, metabolic activity increases, as this produces heat; shivering and muscle activity increase heat. In hot conditions, heat from metabolism need to be lost.

Control of blood flow: Controlling the flow of blood to extremities can be used to reduce heat loss with the environment

Counter-current exchange: Used by endotherms in cold conditions. Blood vessels from extremities and those going to extremities are placed next to each other and they pick up heat from each other.

Evaporation: Endotherms can keep cool by controlling the rate of water evaporation. Dogs pant, birds flutter a throat membrane and humans sweat. Kangaroos can lick their arms to cool themselves.