

Q5d

Mark scheme: An explanation that makes reference to four of the following points:

- vasodilation (1)
- (more) blood to surface / skin (1)
- heat loss / cooling / prevents overheating (1)
- radiation / convection (1)
- affect enzymes (1)

In a cold environment, the diameter of the small artery is smaller and the blood flow is slower. This is to prevent heat loss from the bloodstream to the skin, into the surface. Slow blood flow also reduces the energy used to transport blood. In a warm environment, the diameter is larger to let heat energy to escape, and blood flow has also increased.

~~Vaso dilat~~ Vasodilation occurs, widening the diameter of the small artery and allowing more blood to flow to the surface of the skin where it can transfer ^{heat} energy ~~in~~ to the atmosphere by sweat for the body to cool down.

In a cold environment, the diameter of the small artery is smaller than ~~decreases and the~~ ^{small} the artery in the warm environment. This is because in the cold environment, the blood vessels ^{further from} ~~near~~ the skin's ^{surface} constrict and is called vasoconstriction. There is a lower blood flow to reduce heat lost and the blood ^{vessels} ~~capillaries~~ are further from the skin. While in a warmer environment, the diameter of the small artery is larger due to vasodilation. This causes the blood vessels to go closer to the surface of the skin and more heat can be released to cool the body. This can cause sweating and a higher blood flow. The blood flow in the colder environment is to make sure the muscles in the body remains warm and enzymes do not lose kinetic energy and less collision.

Q7bi

Mark scheme:

An explanation that makes reference to the following points:

- parents both Hh (1)
- gametes are H and h (1)
- offspring are HH, Hh, (Hh) and hh (1)
- first child is hh / second child is HH or Hh (1)

Allow use of different letter

Allow MP 1, 2 and 3 from Punnett square

Allow ecf for gametes only

Man	women
Hh	Hh

	H	h
H	HH	Hh
h	Hh	hh

∴ one child with white hair
∴ the other child without white hair.

Use H to represent the allele for a white patch of hair and h to represent the allele for no white patch of hair.

	H	h
H	HH	Hh
h	Hh	hh

(4)

Probability
75% - White patch of hair
25% - No white patch.

Parents.

Mother

Father

genotype
of
parents

H or h

H or h

Children
genotype

hh or Hh or Hh

The first child without white hair
is having the alleles hh, while
the second child has the alleles Hh, so
it has a white hair.

Use H to represent the allele for a white patch of hair and h to represent the allele
for no white patch of hair.

Genotype of parents

Mother
Hh

Father
Hh

(4)

Genotype of parents

Genotype of offsprings

Phenotype of offsprings

