Homeostasis Worksheet
This worksheet accompanies Glucoregulation.ppt and Thermoregulation.ppt

1. Answer the following questions about maintaining body temperature.
   a. Complete the following sentences.

   Body temperature is managed by the ...................... centre. This system is located in the ...................... and has ...................... that can sense the temperature in the blood. The role of this centre is to maintain a constant ...................... temperature by balancing heat gain with heat loss. The vital organs located deep within the body, such as the heart, liver and kidneys, are maintained at .........°C. This is called the ...................... body temperature.

   b. Complete the diagram below about how the body temperature is brought back to normal. State two ways in which body temperature can be reduced and two ways in which body temperature can be increased.

   temperature increases
   1. .................................................. ..................................................
   2. ..................................................

   temperature decreases
   1. .................................................. ..................................................
   2. .................................................. ..................................................
2. When the temperature of the body deviates from the normal temperature, the brain sends instructions to trigger the effectors. Answer the following questions.

a. On the diagram, circle the effector(s) involved in temperature regulation.

![Diagram with labeled parts: brain, muscle, skin, gland]

b. Michael noticed that he began shivering when he went into his garden. Does shivering occur consciously or automatically?

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d. Michael begins to run around in his garden. Describe what would happen to Michael’s body temperature if he continued to exercise intensely for 30 minutes.

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e. Complete the table about how the skin hairs respond to changes in temperature.

<table>
<thead>
<tr>
<th>temperature</th>
<th>muscle under the skin</th>
<th>position of skin hair</th>
<th>how it affects body temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>below normal body temperature</td>
<td>The muscle at the base of the skin hair contracts.</td>
<td>..........................</td>
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above normal body temperature
The muscle at the base of the skin hair

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Heat can be lost from the surface of the skin easily.
No heat is trapped.
3. The concentration of glucose in the blood is also controlled by the body. Answer the following questions.

a. Are the following statements true or false? Answer by circling T for true or F for false in the space to the left of each statement.

T / F The hypothalamus produces the hormone insulin.

T / F Insulin allows glucose to move from the blood into the cells.

T / F The pancreas produces a second hormone glucagon.

T / F Glucagon stores glucose in the pancreas.

b. Complete the following sentences about the effect of diet on level of glucose in the blood by selecting the correct word(s).

Processed foods, such as cakes, biscuits and sweets contain [low / high] levels of glucose. This is [quickly / slowly] absorbed into the bloodstream, causing a [rapid / slow] rise in blood glucose. Wholemeal bread and oats are high in [simple / complex] carbohydrates and [protein / fibre]. When these foods are digested, glucose is released [quickly / slowly], and the blood glucose [is more constant / fluctuates].
4. The regulation of blood glucose levels is impaired in people with diabetes. There are two types of diabetes. Answer the following questions.

a. Match each characteristic with the type of diabetes it relates to by drawing a line between them.

- Type 1 diabetes
  - late onset
  - more likely to arise because of poor diet or obesity
  - arises when the pancreas stops producing insulin
  - can be controlled by injecting insulin
  - can arise when the body does not respond to its own insulin

b. The graph below shows the level of insulin of a normal person and a diabetic after the ingestion of glucose. Label the line indicating the normal insulin levels and the line indicating the insulin levels of a diabetic.
c. Describe how the levels of blood glucose differ in a diabetic, compared to someone without diabetes, after the ingestion of glucose.

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d. One form of diabetes is controlled by insulin injections. Kris believes that it better to make insulin by genetically-modified organisms rather than use the insulin of cattle and pigs. Why would some people agree and others disagree with Kris?

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