Grade 9 Natural Sciences Worksheet

Excretion

Your body digests food and carries it to your cells where the food is converted into a form of energy that the cells can use. These processes make waste products. The waste products need to be removed from the cells. If the amount of wastes builds up, the cells will become poisoned. The waste products move from the cells into the blood. But this is still not good enough. The wastes need to be removed from the blood too. This is where your kidneys come into the picture. The kidneys are organs that filter the blood and remove wastes and excess salts from the blood. The kidneys then produce a watery substance called urine which you excrete from your body.

Part One: Give the correct answers

Read the passage below and fill in the correct answers in the gaps. A choice of answers is given on the right hand side of the passage.

The _____ are a pair of bean-shaped organs inside the small of the _____. The kidneys filter about 1.3 litres of _____ every minute. All the blood in your body flows through the kidneys every _____ so that the blood is filtered _____ times a day. The kidneys adjust the _____ of the body as well as remove _____ products from the blood. The kidneys also help to keep your blood pressure _____. The kidneys produce the waste substance called _____ which passes to the _____ by the _____. This waste substance then leaves the body via the _____.	salt balance bladder blood stable urethra 150 urine kidneys waste 10 minutes ureters back

[12 marks]

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Part Two: The process in the kidney

Place the following statements in the correct order to illustrate the process that takes place in the kidney.

A. Urine passes down the ureters to the bladder.
B. The blood vessels entering the kidney split into capillaries.
C. Urine leaves the bladder via the urethra.
D. Water is reabsorbed from the nephron back into the blood capillaries.
E. Blood capillaries split into a smaller network of capillaries called the glomerulus.
F. There are thousands of filtration units in the kidney called nephrons.
G. The nephron starts as a cuplike structure called the Bowman's capsule.
H. Urine is stored in the bladder.
I. Wastes are filtered from the glomerulus into the Bowman's capsule.
J. Any useful molecules are reabsorbed into the blood and any wastes that were missed in the Bowman's capsule are added to the tubule.

[10 marks]

Part Three

What would happen if the excretory system did not work properly?

How would your body be affected?

Explain your ideas to a partner. Try and reach some agreement.

Your teacher will allow you to share your ideas in a class discussion.

When you have discussed these issues, write up your ideas in a short report or paragraph.

[10 marks]

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Suggested Solutions

Question number	Possible marks	Solution
1	12	The *kidneys* are a pair of bean-shaped organs inside the small of the *back*. The kidneys filter about 1.3 litres of *blood* every minute. All the blood in your body flows through the kidneys every *10 minutes* so that the blood is filtered *150* times a day. The kidneys adjust the *salt balance* of the body as well as remove *waste* products from the blood. The kidneys also help to keep your blood pressure *stable.* The kidneys produce the waste substance called *urine* which passes to the *bladder* by the *ureters.* This waste substance then leaves the body via the *urethra.*
2	10	A. There are thousands of filtration units in the kidney called nephrons. B. The nephron starts as a cuplike structure called the Bowman's capsule. C. The blood vessels entering the kidney split into capillaries. D. Blood capillaries spilt into a smaller network of capillaries called the glomerulus. E. Wastes are filtered from the glomerulus into the Bowman's capsule. F. Any useful molecules are reabsorbed into the blood and any wastes that were missed in the Bowman's capsule are added to the tubule. G. Water is reabsorbed from the nephron back into the blood capillaries. H. Urine passes down the ureters to the bladder. I. Urine is stored in the bladder. J. Urine leaves the bladder via the urethra. (A, B and C, D could be reversed as they are descriptive of the anatomy rather than the process. F and G could also be reversed as they occur simultaneously.)
3	10	Learners should come to the conclusion that without a system to remove wastes from the body, the levels of toxins would increase and poison the body. This may be reversible at first, but then the body would not be able to cope with the increased toxicity and functioning would begin to break down. Death could result. Learners can be encouraged to research diseases that bring about kidney failure. They can talk about renal dialysis and consider kidney transplants. Assess the paragraphs or reports based on the way the learner reports

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		back on the discussion and how well he/she is able to summarise the discussion.