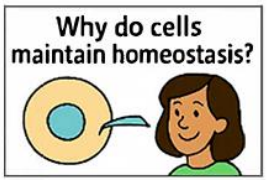
Biology TCAP/EOC Parent-Student Practice Assessment

Standard BIO1.LS1 **(Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.)**

Question 1

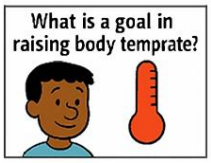
A cell removes a toxin (a harmful waste product) that it produced during a chemical reaction. Which characteristic of living things does this action show?



A cell removes a toxin it has produced through a chemical reaction.
Which characteristic of living things is the cell demonstrating?
A. the ability to maintain homeostasis
B. the ability to grow and develop
C. the ability to adapt and evolve
D. the ability to reproduce

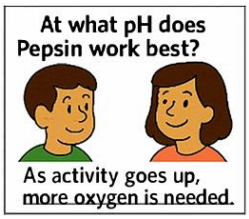
Question 2

The diagram shows a response the body uses to raise temperature after it drops. The response works to maintain…
A. high body temperature.
B. low body temperature.
C. hormone balance.
D. constant body temperature.



Question 3

Pepsin is an enzyme that helps in the digestion of proteins. The graph shows the effect of pH on pepsin activity.



Which best describes the data shown in the graph?

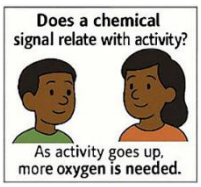
A. Pepsin functions best in acidic environments.

B. Pepsin activity is least effective in low pH environments.

C. Pepsin remains very active over a broad range of pH values.

D. Pepsin is more active at high pH values than at low pH values.

Question 4



Which of these is the best example of a chemical signal from one cell type regulating processes in another type of cell?

A. Acetylcholine from the axon of neurons acts on neighboring dendrites.

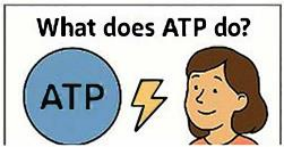
B. Insulin produced by islets of Langerhans stimulates the liver to store glucose.

C. Fibrinogen in the blood forms bridges between platelets helping clots to form.

D. Antibodies produced by B cells attack viruses that have infected the body

Question 5

Isabelle wants to determine whether a homeostatic process requires energy to proceed. Which characteristic should she look for?



A. a reaction that is coupled to the hydrolysis of ATP

B. a reaction that is coupled to the production of ATP

C. movement of a substance across a membrane with a gradient

D. movement of a substance across a membrane in both directions

Question 6

Ava conducted an experiment to determine respiratory rates during different activities. She counted the number of breaths per minute. Ava noted that the number of breaths increases as physical activity increases. Why is there an increase in the number of breaths per minute as activity increases?

A. As activity increases, more oxygen is exhaled.
B. As activity increases, breathing becomes more efficient.
C. As activity increases, the oxygen needs of cells increase.
D. As activity increases, the rate of the heart beating increases.

Question 7

In the human body, the thyroid gland releases hormones that affect the rate of cellular metabolism. Which of the following best describes the negative feedback mechanism that controls how much of this hormone is released?

A. The cells affected by thyroid hormones absorb specific amounts of the hormone.
B. When the blood concentration of thyroid hormones reaches a certain level, production stops.
C. When the cellular metabolism drops below a certain level, thyroid hormone production starts.
D. The cells that produce thyroid hormones die after making a certain amount.

Questions	Answers	Explanations
1	A	Living things must keep their internal conditions balanced so their cells can work properly. When a cell removes toxins, it is “cleaning up” to keep itself healthy and stable — this is called homeostasis.
2	D	The diagram shows hormones being released to help raise body temperature back to normal. This process helps the body maintain a steady internal temperature, even when the outside temperature changes.
3	A	The graph shows pepsin working the most at a low pH level. Low pH means something is acidic, like the stomach. This tells us pepsin works best in the acidic conditions found in the stomach.

4	B	A chemical signal happens when one type of cell sends a message to another. Insulin is a hormone released by certain cells in the pancreas, and it tells liver cells what to do. This is a clear example of one cell type controlling another through a chemical signal.
5	A	Some body processes require energy to work. ATP is the molecule cells use for energy. If a process needs the breakdown of ATP, that means the cell is using energy to keep balance — a sign of active homeostasis.
6	C	When you move more — like running or playing — your muscles need more oxygen. To get more oxygen into the body, breathing speeds up. That's why the number of breaths increases during physical activity.
7	B	The body uses negative feedback to stay balanced. When there is enough thyroid hormone in the blood, the body stops making more. When levels drop, the body makes more again. It works like a thermostat turning on and off.