5 Temperature and pH – Part 2

Name: _____ Class: _____ Date: _____

Vocabulary

Write each word three times.

English	**Write it 3 times** (English)		
temperature			
kinetic energy			
optimum temperature			
denatured			
optimum pH			

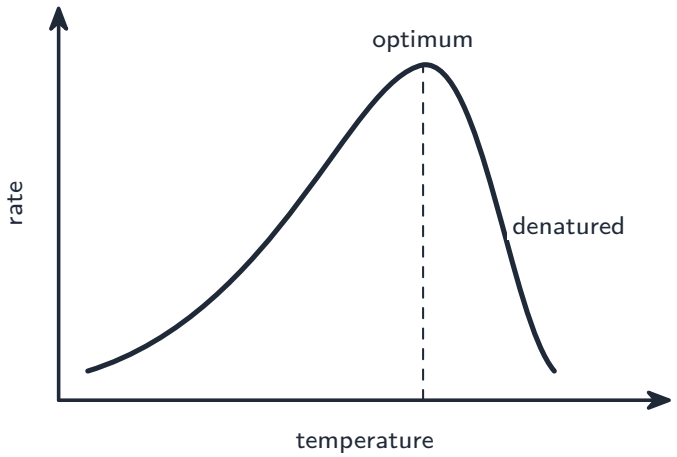
Recall

Each enzyme works best in certain conditions. Two conditions matter most: **temperature** and **pH**.

New ideas

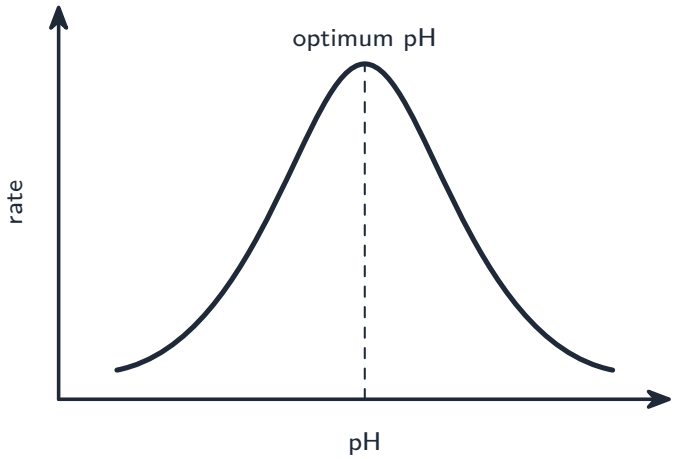
Read these first, then do the Practice.

1 Temperature



- As it warms up, the reaction speeds up – molecules have more **kinetic energy** and meet more often.
- The rate is highest at the **optimum temperature** (about 37 °C in humans).
- If it gets too hot, the active site changes shape and the substrate no longer fits – the enzyme is **denatured** . This is permanent.

2 pH



Each enzyme has one **optimum pH** pH. If the pH is too high or too low, the active site changes shape and the enzyme is denatured.

Note: "denatured" does **not** mean "killed" – enzymes are not alive. It means the active site has lost its shape, so the substrate no longer fits.

> **Watch out:** above the **optimum**, heat **denatures** the enzyme – the active site loses its shape and the substrate no longer fits. Denaturing is **permanent** and does **not** mean "killed" (enzymes are not alive).

Practice

Try these in order.

5.6 At about what temperature do human enzymes work best? [1]

5.7 Why does enzyme activity increase as the temperature rises (before the optimum)? [1]

5.8 What does "denatured" mean? [2]

5.9 Is denaturing an enzyme by heat reversible? [1]

5.10 Name two conditions that can denature an enzyme. [2]

5.11 Challenge. An enzyme works fastest at 40 °C. Predict and explain what happens to its rate at (a) 10 °C and (b) 70 °C. [3]