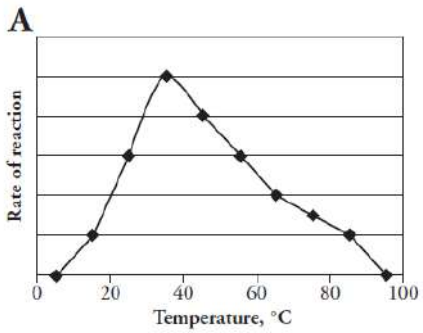
ENZYME POGIL-PCR

Thermophilic bacteria, such as *Thermos aquaticus*, live in hot springs where the temperature is greater than 70° C.

Model 2 – Amylase Rate of Reaction



1. Add a line to graph A in Model 2 from your POGIL-Enzyme packet representing the optimal temperature of this enzyme in *T. aquaticus*.

2. How do you think the graph you drew for *Taq* DNA polymerase would compare to a graph for other enzymes from the same organism? EXPLAIN YOUR ANSWER.

DNA polymerase from *T. aquaticus* (*Taq* polymerase) is used in PCR (polymerase chain reaction). PCR is a technique where millions of copies of a specific segment of DNA can be made from one original copy. IN this method, the target DNA molecule is subjected to temperatures over 95° C to make the double-stranded DNA separate. The temperature is then lowered slightly to allow primers to anneal before the *Taq* polymerase catalyzes the reactions to incorporated new nucleotides into the complimentary strands. The cycle is then repeated over and over until there are millions of copies of the target DNA.

3. EXPLAIN why this bacterial polymerase is used for PCR instead of human polymerase.

4. What would happen if human polymerase was used in a series of PCR reactions instead?