Q1. What is the function of each component of a PCR reaction?

Template DNA:	The sample of DNA which contains the sequence that will be copied.
Primers:	Human built single strand segments of DNA, customized to attach to the ends of other DNA strands. Assists the Taq Polymerase in binding to the DNA template.
Taq Polymerase:	Attaches itself to the base strand of DNA and begins adding nucleotides.
Deoxyribonucleotides (dNTP's):	The building blocks of a DNA molecule. Composed of the four letters A (adenine), T (thymine), C (cytosine) and G (guanine)

Q2. What happens to the components (listed above) during each step of thermal cycling?

INITIAL STEP: 95°C for 3 minutes:	The doubled stranded DNA molecule begins to separate.
Denature at 95°C for 30 seconds:	Two single strands of DNA form after the chemical bonds holding the double strand together break.
Anneal at 57°C for 30 seconds:	The primers come in and attach to the DNA single strands
Extend at 72°C for 30 seconds:	DNA polymerase initiates by attaching to the primer, adds nucleotides.
FINAL STEP: 72°C for 3 minutes:	Nucleotides are continually added to the DNA strands until they approach the end, when the nucleotides will fall off the strand loosely.
FINAL HOLD: 4°C:	DNA single strands form into a double strand, kept cool for a future measurement.

Q3. DNA is made up of four types of molecules called nucleotides, designated as A, T, C and G. Base-pairing, driven by hydrogen bonding, allows base pairs to stick together. Which base anneals to each base listed below? If you need help, use the "Build a DNA Molecule" tool at http://learn.genetics.utah.edu/content/begin/dna/builddna/

Adenine (A):	T	Thymine (T):	A	Cytosine (C):	G	Guanine (G):	C

Q4. During which two steps of thermal cycling does base-pairing occur? Explain your answers.

Both the annealing phase and the extending phase allow for base pairing to occur. For the annealing phase, the primers will attach themselves to the ends of the single strand DNA fragments and will form matching base pairs with the template DNA. The extending phase will have Taq Polymerase binding to the primers, creating nucleotides that will also form base pairs as well. This will continue into the final phase.