CONCEPT: INTRODUCTION TO POLYMERASE CHAIN REACTION

●When a researcher studies the DNA sequence of a *specific* gene in a genome, they need _____ copies of it.

●**Polymerase Chain Reaction (_____):** technique used to *rapidly* isolate & *amplify* a *specific* sequence of DNA.

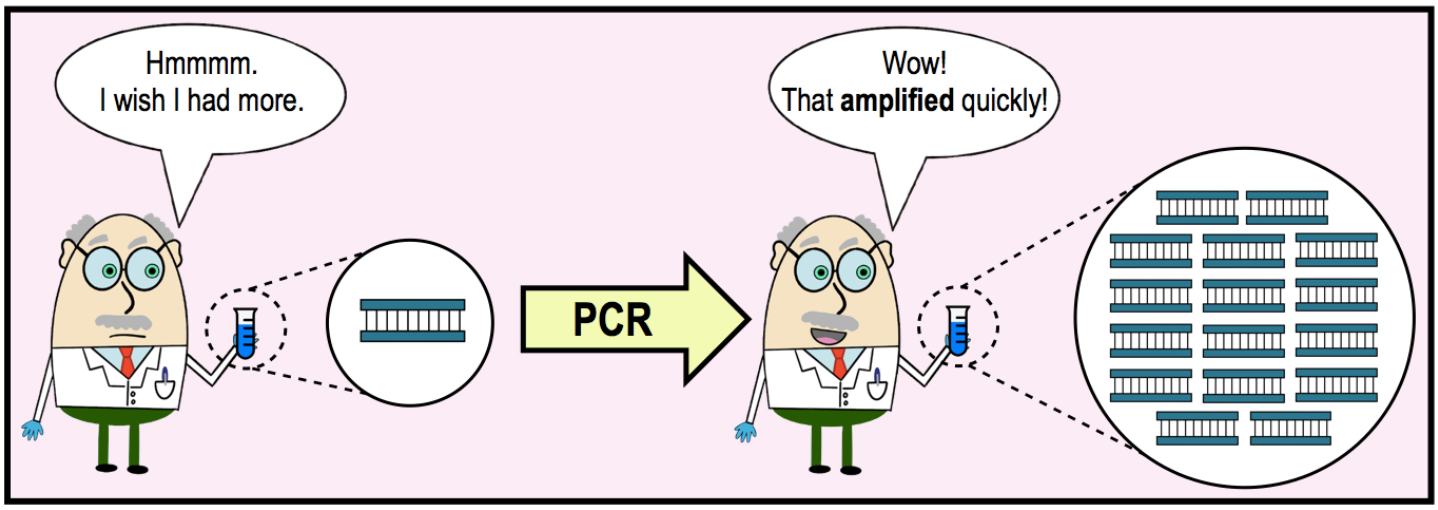
- □ *Amplify*: to make _____ copies.
- □ Unlike DNA cloning (which uses living cells), PCR takes place in a _____ _____.

Why do we use PCR?

●PCR is a quick & efficient process for generating many _____ copies of DNA in a *test tube*.

- □ *DNA cloning* is **more** accurate, BUT _____ efficient (*in the cell:* less mutations but longer time to amplify).

EXAMPLE: PCR can be used to amplify the amount of DNA taken from a crime scene so a detective can investigate it.



PRACTICE: PCR is used to _____.

a) Amplify a single gene or small sequence of DNA.
b) Create DNA without introns.
c) Insert foreign DNA into a host cell where it can be replicated.
d) Cut segments of DNA creating complimentary sticky ends.
e) None of these.

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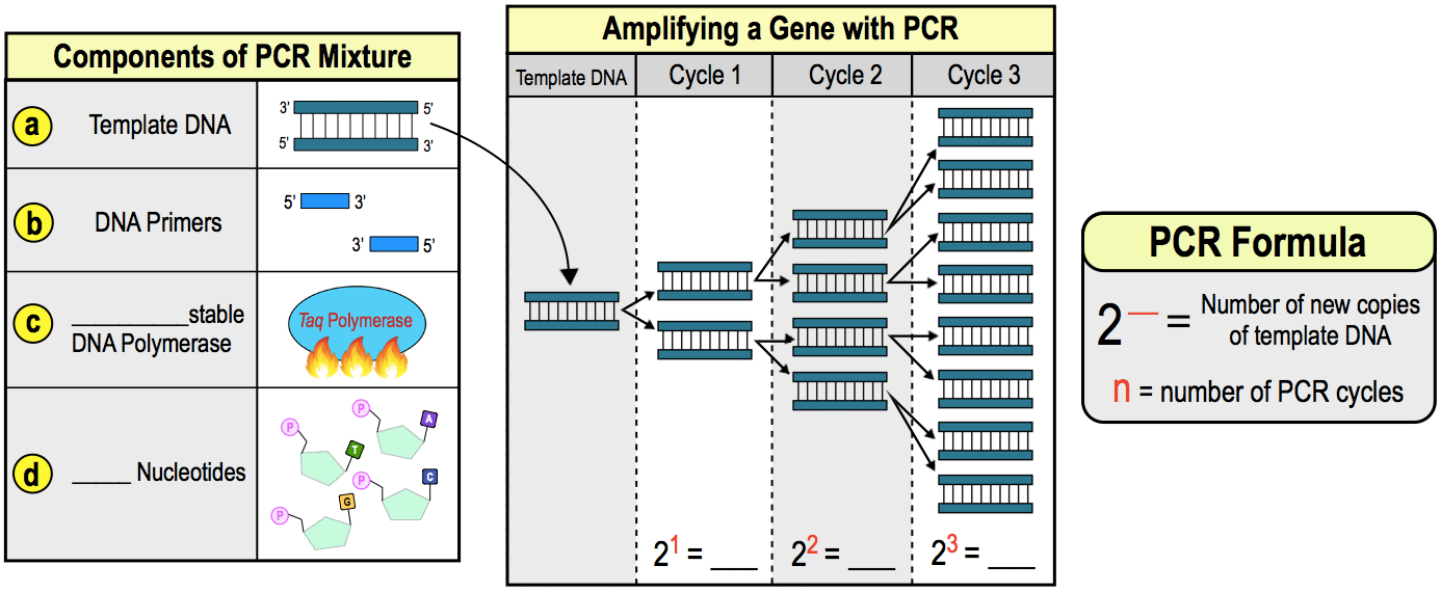
Components of a Polymerase Chain Reaction

- *Recall:* PCR differs from DNA cloning in the location that DNA is replicated (PCR in a test tube & cloning in a cell).
- The components of a PCR mixture include:
  - (a) **Template** _____ containing the sequence of interest for the study.
  - (b) 2 _____ that are complementary to *opposite* strands of DNA & are oriented *towards* each other.
  - (c) A *thermo-stable* DNA _____ to synthesize the sequence of interest.
  - (d) All ____ deoxyribonucleotides used to synthesize DNA.



PRACTICE: PCR requires all of the following EXCEPT:

a) Primers.
b) DNA ligase.
c) DNA polymerase.
d) DNA of interest.
e) Deoxyrobinucleotides.

PRACTICE: The polymerase chain reaction:

a) Doubles the template sequence of DNA with each cycle.
b) Makes a single copy of the template sequence of DNA with each cycle.
c) Is used to determine the sequence of a region of DNA.
d) All are correct.