

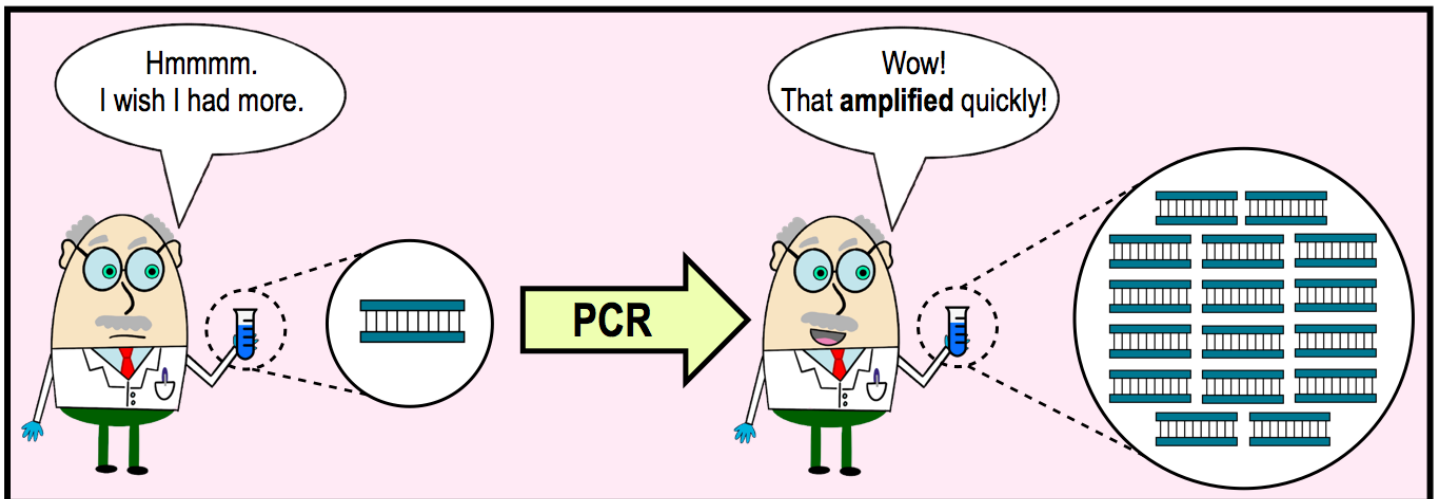
CONCEPT: INTRODUCTION TO POLYMERASE CHAIN REACTION

- 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.



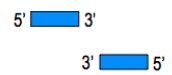
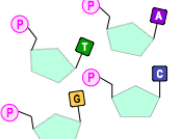
PRACTICE: PCR is used to _____.

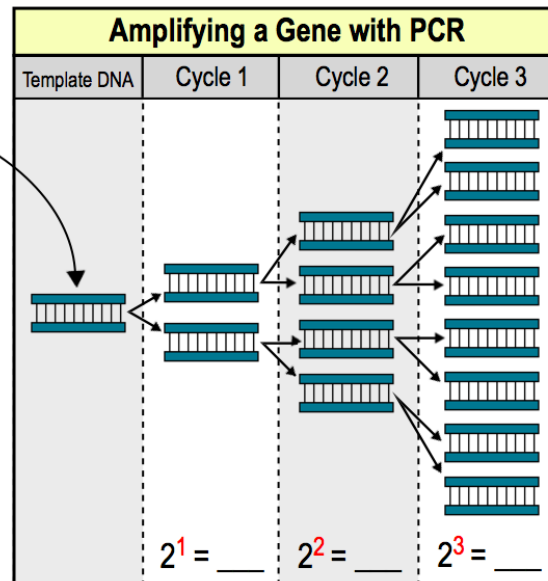
- Amplify a single gene or small sequence of DNA.
- Create DNA without introns.
- Insert foreign DNA into a host cell where it can be replicated.
- Cut segments of DNA creating complimentary sticky ends.
- None of these.

CONCEPT: INTRODUCTION TO POLYMERASE CHAIN REACTION

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.

Components of PCR Mixture	
a Template DNA	
b DNA Primers	
c _____ stable DNA Polymerase	
d _____ Nucleotides	



PCR Formula

2^n = Number of new copies of template DNA

n = number of PCR cycles

PRACTICE: PCR requires all of the following EXCEPT:

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

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.