**Hand-out 3**

**Polymerase Chain Reaction (PCR) – Amplifying DNA**

**Introducing PCR**

We know that **DNA replication** occurs naturally in cells before cell division.

Given the correct conditions, DNA fragments can be **amplified**, through repeated cycles of **artificial** replication, by the process known as **the Polymerase Chain Reaction (PCR).**

* During \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ many copies of a piece of DNA are made, each PCR cycle \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the number of DNA fragments.
* PCR is a technique which can be used to produce billions of copies of a specific \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of DNA.
* PCR is used to make **copies** of a piece of DNA ***in vitro*** i.e. outside the body of the organism **\_\_\_\_\_\_\_\_\_\_\_\_\_\_**.
* The process involves **cycles of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** thereby exposing DNA to a series of temperature changes.

**Research task: PCR ‘Expert’**

* *Carryout the research task as directed by your teacher. You can use paper or whiteboards to make notes on your research topic.*

**Requirements for PCR**

If you wanted to amplify DNA what would you need?

**The PCR Process in Brief (Learn this!)**

**Pattern of Amplification of a target sequence of DNA**



* What is the function of PCR?
* What term describes the production of multiple copies of DNA using PCR?
* Why is cooling important during the second stage of PCR?
* Short sections of DNA called primers are required for PCR. When they are added during the second stage of the thermal cycle what do they do?
* What is the role of DNA polymerase?
* Why is the temperature increased during the final stage of the PCR cycle?