

Starter:

Review quiz

https://forms.office.com/Pages/ResponsePage.aspx?id=ExyS6wu_skOzPCv2Xh3qVggdecDQTHdMsBCbqthJXplUQ0cxMUtDNjdGTVJJRzY2TUptVTVdVWFU2Qy4u

If you have not yet completed MG4 Gel electrophoresis, please do so as part of your home learning.



Mark scheme for MG4 Questions p6

a) A endonuclease

b) B electrophoresis

c)

- STRs are short tandem repeats
- found in the non-coding regions / introns of DNA
- you inherit them from your parents
- STRs are repeated sequences of bases
- you can inherit different numbers of repeats from each parent
- everyone has a unique combination of numbers of repeats
- STRs can be cut out of DNA using restriction endonucleases
- the fragments can be separated using gel electrophoresis
- shorter fragments travel further
- the pattern of banding on the gel plate reflects the length of the STRs
- these can be visualised by the addition of primers with radioactive or fluorescent tags
- in this case all the bands in the sample match with suspect 3 so they are the most likely to have left the blood sample.

Mark scheme for MG4 Questions p6

d)

- if a sufficient number of loci are examined, then DNA profiling can be highly accurate in identifying an individual
- however, if a small number of loci are used then you have a greater chance of two people having the same combination of repeats
- identical twins will have identical profiles
- people who have close family ties will also have similar profiles
- there can be errors in the process / contamination of samples

Manipulating genomes

- **DNA profiling**
- **DNA sequencing and analysis**
- **Using DNA sequencing**
- **Genetic engineering**
- **Gene technology and ethics**

Specification points: 6.1.3 Manipulating genomes

(c) the principles of DNA profiling and its uses

To include forensics and analysis of disease risk.

(d) the principles of the polymerase chain reaction (PCR) and its application in DNA analysis

(e) the principles and uses of electrophoresis for separating nucleic acid fragments or proteins Opportunity for practical use of electrophoresis. PAG6

Running PCR

Unfortunately, sometimes we cannot get enough DNA from the sample – why not?

We need to produce multiple copies of the sequences we want – we use a method called PCR – Polymerase Chain Reaction – to produce these multiple copies.

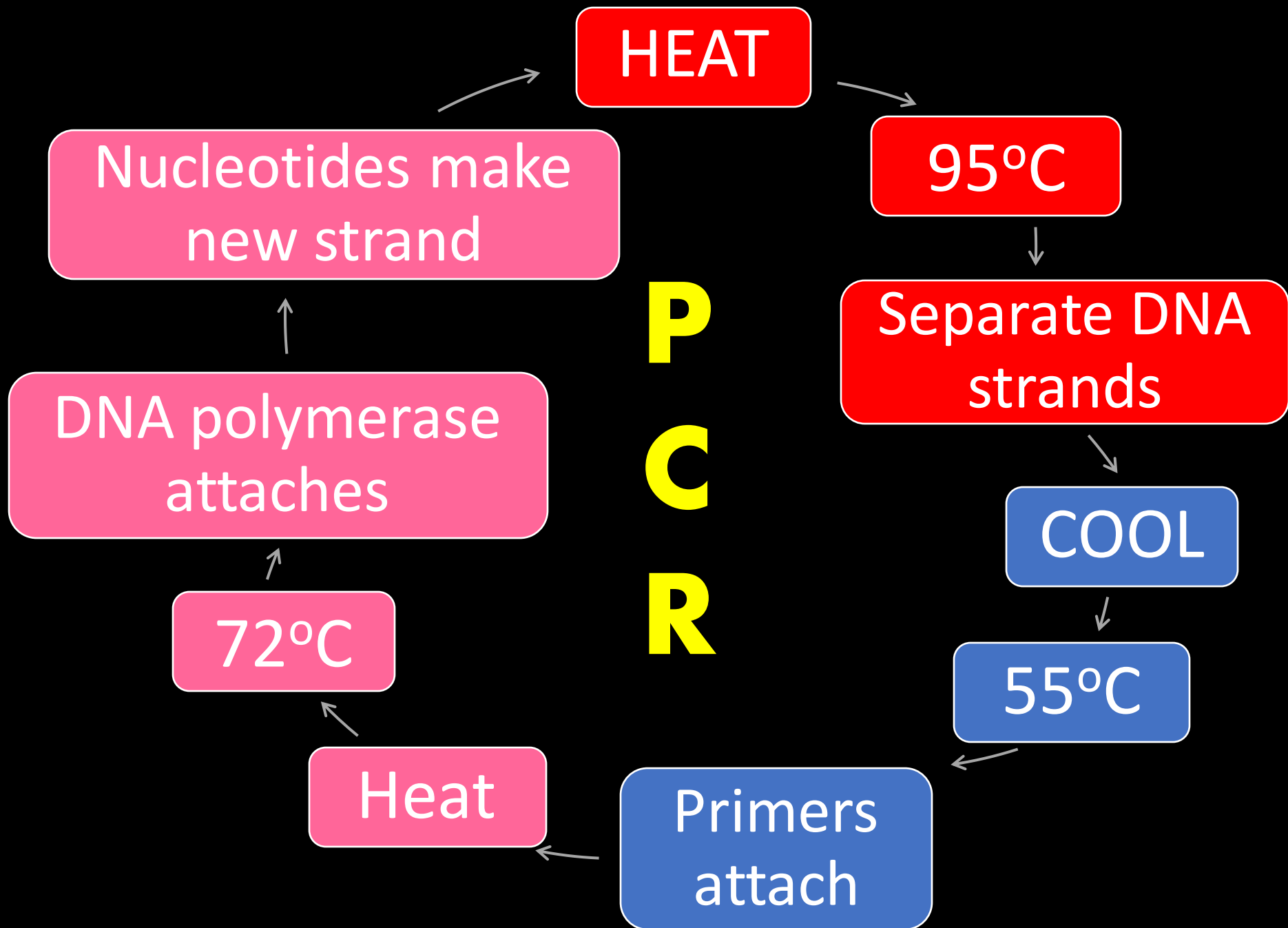
View the interactive lab at learn genetics Utah and complete the questions from Man Gen 5 PCR as you complete the interactive.

<https://learn.genetics.utah.edu/content/labs/pcr/>



Extension:

<http://www.dnalc.org/view/15475-The-cycles-of-the-polymerase-chain-reaction-PCR-3D-animation-with-no-audio.html>



Reliability of DNA Profiling

MG6 – Uses and reliability of DNA profiling

What is DNA profiling used for and is it reliable?

Read the article on pages 8-9 of your booklet.

Read "Pitfalls of Profiling" p556 and answer the questions, plus summary question 3.

MG7 DNA Profiling exam questions

22 marks – complete these questions