PCR – the polymerase chain reaction

- Millions of copies of DNA can be produced from very small amounts in a few hours.
- DNA from small samples of hair, blood, saliva, semen, other tissue or long-dead specimens can be **amplified** to produce larger amounts for analysis:
    - DNA is heated to 95°C to separate the two strands.
    - The temperature is reduced to 53 °C, which lets primers bind to both strands of the DNA next to the sequence being copied.
    - The temperature is increased to 73 °C, which encourages Taq DNA polymerase to replicate both strands, starting at the primer, producing two double-stranded copies of the original DNA.
    - The process is repeated many times.

Gel electrophoresis

- Involves separating mixtures of DNA, proteins or other charged molecules.
- The mixture is placed on a thin sheet of gel; electrodes are attached to both ends and an electric field is applied.
- Negatively charged particles move to the positive electrode – the rate of movement depends on the size and charge of the molecules – small, highly charged molecules move faster than large or less-charged ones.