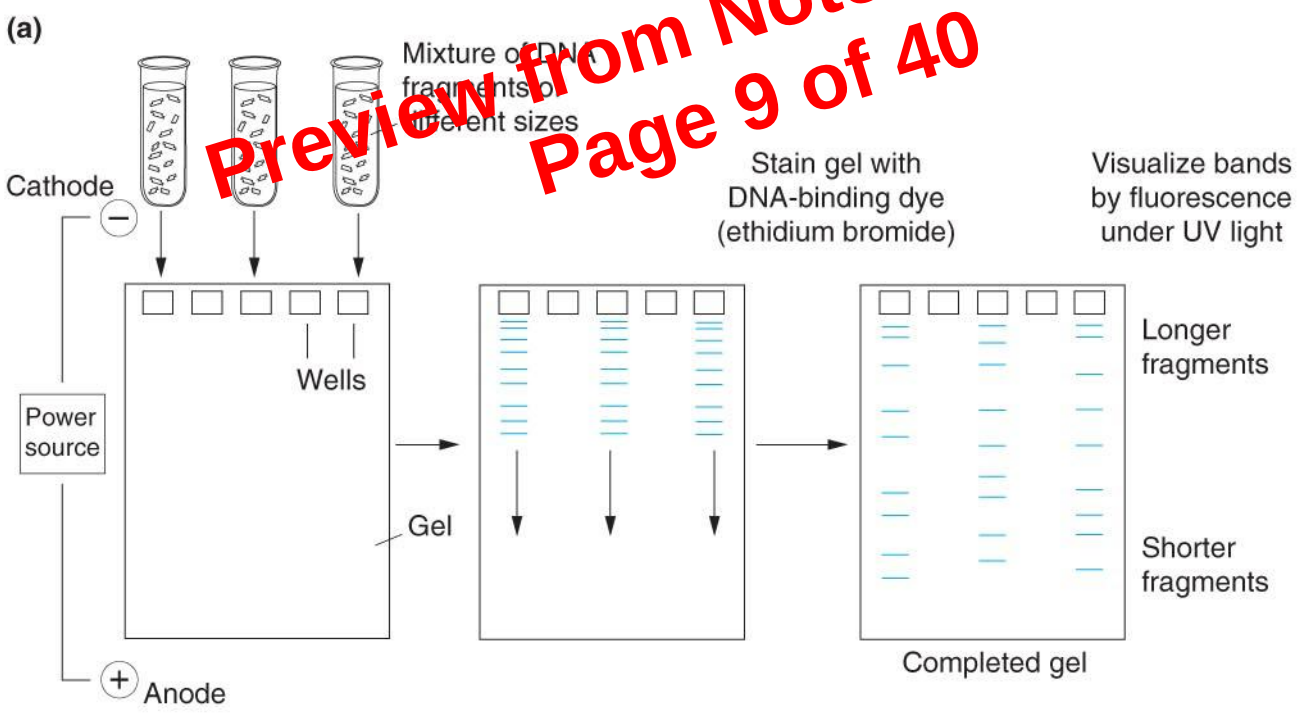
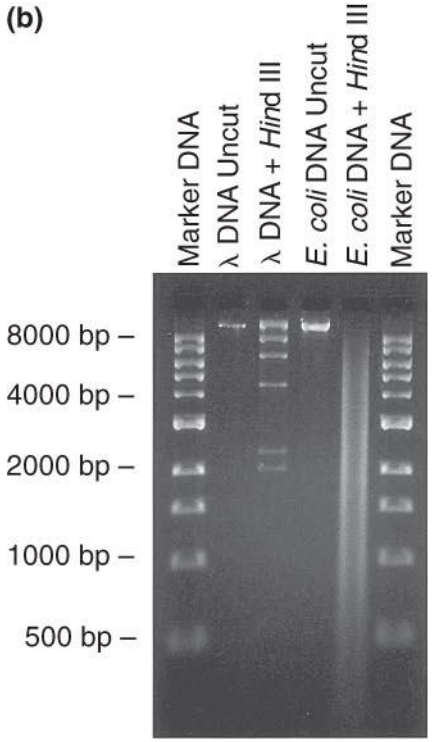
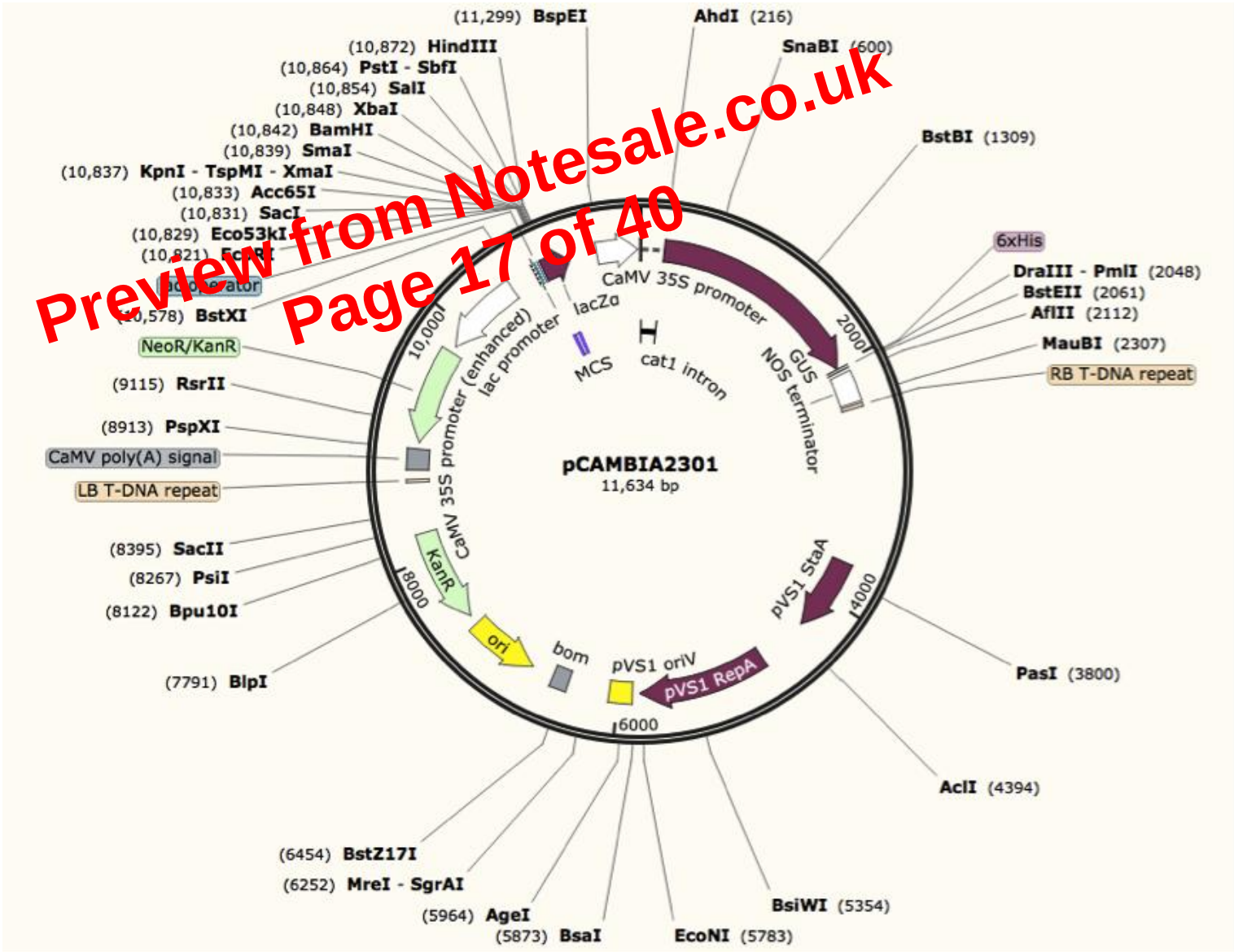
Gene Technology

Agarose gel electrophoresis







1. Introduction to Recombinant DNA Technology and DNA Cloning

- Transformation of Bacterial Cells
  - very inefficient process
  - A process for inserting foreign DNA into bacteria
    - Treat bacterial cells with calcium chloride
    - Add plasmid DNA to cells chilled on ice
    - Heat the cell and DNA mixture
    - Plasmid DNA enters bacterial cells and is replicated and express their genes
  - *electroporation*
  - Apply brief pulse of high voltage electricity to create tiny holes in the bacteria cell wall that allow the DNA to enter

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- Selection of recombinant bacteria after transformation
  - **Selection** is a process designed to facilitate the identification of recombinant bacteria while preventing the growth of non-transformed bacteria and bacteria that contain plasmid without foreign DNA
  1. Antibiotic selection – plate transformed cells on plates containing different antibiotics to identify recombinant bacteria and non-transformed bacteria
     - Does not select for plasmid containing foreign DNA vs. recircularized plasmid

-Some recombinant plasmids now contain hummingbird DNA

-The DNA mixture is added to bacteria that have been genetically engineered to accept it

-The bacteria are plated on a type of agar that selects for the bacteria with recombinant plasmids

-This results in the cloning of many hummingbird DNA fragments, including the *β*-globin gene