

# Manipulating DNA Notes

Scientists use their knowledge of the structure of DNA and its chemical properties to study and change DNA molecules.

## Tools of Molecular Biology

### 1. Gel Electrophoresis

- DNA Extraction**- using chemicals to remove DNA from the nucleus of the cell
- Cutting DNA**- DNA is much too long to be analyzed, so we cut it into smaller fragments using restriction enzymes, which cut DNA at a specific sequence of nucleotides.
- Sequencing DNA**- DNA fragments can be separated by weight and length in order to analyze specific sequences (order of bases).
  - DNA fragments are inserted into a porous gel, and then a voltage is passed through, pulling the DNA to the opposite side of the gel.
  - DNA is negatively charged.
  - The DNA sequence can then be "read" as the lighter segments will travel further and faster.



### 2. Transformation- a cell takes in DNA from another source and combines them together to make recombinant DNA.

- **Recombinant DNA**- DNA that is made by connecting fragments of DNA from different sources.
- Restriction enzymes are used to cut a sequence of DNA.
- What is leftover? A double stranded DNA fragment with a single stranded end.
- Next, a vector is used to insert the DNA into its new source. A **vector** is a carrier in which foreign DNA can be transferred into a host cell.
- Vectors can be:
  - Mechanical**- to introduce DNA into a nucleus
  - Biological**- virus DNA or plasmids (a small ring of DNA found in a bacterial cell).
- Finally, gene splicing rejoins the cut pieces of DNA through the use of DNA ligase (an enzyme which acts like tape to join the pieces together).



# Manipulating Dna Study Guide

**Kathleen Armour**



## **Manipulating Dna Study Guide:**

## Unveiling the Magic of Words: A Overview of "**Manipulating Dna Study Guide**"

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