MUTATIONS

- **Mutations** are changes in genes or ____________
- Mutations may be **spontaneous** (i.e. arise naturally as random errors in DNA) or **induced** (i.e. deliberately or accidentally produced by ________ or radiation).
- **Mutagens** are chemicals or forms of radiation that cause ____________ (e.g. Agent Orange)

**2 TYPES OF GENE MUTATIONS**

1. **Replacement of one nucleotide by another (also called Point Mutation)** may lead to:
   - ♦ No change in the ____________ formed
   - ♦ Change in an amino ________ and protein
   - ♦ Non-functional protein or incomplete protein if a stop ________ is formed

2. **Addition or deletion of a nucleotide** will probably cause a non-functional protein.

**TYPES OF CHROMOSOME MUTATIONS**

1. **Changes in the Number of Chromosomes** can be of two types:
   - ♦ **Polyploidy** – is a condition of having ________ sets of chromosomes to make organisms such as plants tetraploid (____n).
   - ♦ **Aneuploidy** – is a condition of the gain or ____________ of individual chromosomes. Examples include Downs’ Syndrome (extra No. ________ chromosome), Turner Syndrome (extra X chromosome in a female), and Klinefelter Syndrome (extra X chromosome in a male).

2. **Change in the Structure of Chromosomes**