|  |  |
| --- | --- |
|  | **Mutation** =  Change in the DNA code or sequence |
|  | 1. **Reproductive Cells**  * Egg or sperm cell * Passed onto offspring   - possible effects include: production of a new trait, dysfunctional protein, lethal, or positive effects (evolution)   1. **Body Cells**   - Change in body cell (liver, skin, brain, etc.)   * No passed to offspring   -possible effects include: damage function of that cell |
|  | 1. **Point mutation =** change in single base pair in DNA   **Example: CTT 🡪 CAT**  **Possible effects:** wrong amino acid is made so the function of the protein could be messed up   1. **Frameshift mutation** = single base is added or deleted from DNA sequence which causes shift in reading of the codons   **Example:**   * **Deletion = GCCATTCGC 🡪 GCATTCGC** * **Insertion = GCCATTCGC 🡪 GCCATCTCGC** * **Inversion = GCCATTCGC 🡪 GCCTTACGC** * **Translocation = GCCATTCGC 🡪 GCCCGCATT**   **Possible effects:** all amino acids after the addition or deletion are wrong. This is SO much worse. |
|  | 1. **Chromosomal mutation** = change in chromosome   **Examples:**   * 1. Deletion: nucleotide sequence is deleted   2. Insertion: new nucleotide added   3. Inversion: nucleotide rotates 180o   4. Translocation: moved to new location   **Possible Effects:** offspring dies, or sterile |

|  |  |
| --- | --- |
|  | **Causes of Mutations:**   * Spontaneous- mistakes during transcription * Mutagen= any agent that can cause change in DNA   Ex: **R**adiation (X-rays, UV Light)  **C**hemicals (asbestos, cyanide, formaldehyde)  **H**igh Temperatures |