Biology Unit Planner: Molecular Genetics

Reference: www.loreescience.ca → Grade 12 Biology → Molecular Genetics
Nelson: Biology 12 → Unit 3: Chapters 6-8

Topics	Key Concepts
• Ethical Issues in Genetics	- Stem cells, GMOs, DNA fingerprinting, Gene patenting, Cloning
• DNA Structure & History	- Leading Strand, Lagging strand, DNA Helicase, SSBP's, DNA Polymerases, Gyrase, 3', 5', RNA Primers, Leapfrogging, Okazaki Fragments, Replication fork/bubble
• DNA Replication	
• One Gene-One Polypeptide Hypothesis	- Central Dogma: DNA→RNA→Protein
• Transcription	- DNA → mRNA - Genomes: Genes & Non-Coding DNA - Nucleus, Promoters (TATA box), Template strand, RNA Polymerase, 5' to 3', mRNA, Terminators, Introns, Exons, Processing, 5' cap, Poly-A tail
• Translation	- Cytoplasm, tRNA, rRNA, Ribosome A-P-E sites, Start codon, Genetic code & amino acids, Stop Codon, Amino Acid interactions = shape, Wobble hypothesis
• Mutations	- Causes: Physical/Chemical, Spontaneous errors, Germ/Somatic - Types: Point (Substitution & Insert/Delete), Inversion, Duplication, Translocation, Transposon - Effects: Silent, Missense/nonsense, Wobble Effect, Role of Introns, Non-Coding Sections - Significance: Loss of function, Enhanced Function, Advantage
• Control Mechanisms	- Lac Operon & Trp Operon - Operons, Regulators

Genetics Terms to Know

- 3’
- 5’
- Adenine
- Aminoacyl-tRNA
- Anticodon
- Antiparallel
- BRCA Gene
- Central Dogma
- Chargaff
- Chargaff’s Rule
- Codon
- Complimentary Base-Pairing
- Cytosine
- Daughter Strand
- Deletion
- Deoxyribose Sugar
- DNA Fingerprinting
- DNA Gyrase
- DNA Helicase
- DNA Ligase
- DNA Polymerase I
- DNA Polymerase III
- DNA Template
- Double Helix
- Double Helix
- Downstream
- Elongation
- Exonuclease A site
- Expression
- Frame shift
- Franklin
- Gene Patenting
- Gene Regulation
- Genes
- Genetically Modified Organisms
- Glycosyl Bond
- Griffith
- Guanine
- Hammerling
- Hershey & Chase
- Housekeeping genes
- Induced mutation
- Induction
- Initiation
- Insertion
- Inversion
- lac Operon
- Lagging Strand
- Large Subunit
- Leading Strand
- Missense mutation
- mRNA
- Mutagenic agent
- Mutation
- Nitrogenous Base
- Nonsense mutation
- Nucleotide
- Okazaki Fragments
- Operator
- Operon
- Origin of Replication
- P site
- Parental Strand
- Peptide Bond
- Phosphate Group
- Phosphodiester Bond
- Pluripotent
- Point Mutation
- Polypeptide
- Posttranscriptional
- Posttranslational
- Primase
- Promoter
- Promoter Region
- Purine
- Pyrimidine
- Reading Frame
- Release Factor
- Replication
- Replication Bubble
- Replication Fork
- Repression
- Reproductive Cloning
- Ribosome
- RNA Polymerase II
- RNA Primer
- Semiconsevative
- Silent mutation
- Single-Stranded Binding Proteins
- Small Subunit
- Spontaneous
- Stem Cell
- Substitution
- TATA Box
- Termination
- Termination Sequence
- Therapeutic Cloning
- Thymine
- Totipotent
- Transcription
- Transcription Factor
- Transcription factors
- Transcription Unit
- Transcriptional
- Translation
- Translational
- Translocaiton
- Transposable
- tRNA
- trp Operon
- Upstream
- Watson & Crick
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