

Genetics Cheatsheet

DNA and RNA

Nucleotides

Nucleotide	DNA	RNA
Adenine	A	A
Cytosine	C	C
Guanine	G	G
Thymine	T	
Uracil		U

Complementary Base Pairing

DNA	RNA
A-T	A-U
C-G	C-G

DNA Replication

1. Helicase unwinds the DNA double helix
2. Primase adds RNA primer to the template strand
3. DNA polymerase adds nucleotides to the growing strand
4. Leading strand is synthesized continuously while lagging strand is synthesized in Okazaki fragments
5. DNA ligase joins the fragments on the lagging strand

Transcription

1. RNA polymerase binds to the promoter region of DNA
2. DNA unwinds and RNA polymerase adds nucleotides complementary to the template strand of DNA
3. RNA polymerase reaches the terminator region and the newly synthesized RNA strand is released

Translation

1. mRNA binds to a ribosome
2. tRNA with complementary anticodon and amino acid bind to the mRNA codon
3. A peptide bond is formed between the amino acids
4. Ribosome moves to the next codon on mRNA and the process repeats
5. The polypeptide chain is released when a stop codon is reached

Mendelian Genetics

Laws of Inheritance

1. Law of Segregation - each parent has two copies of a gene, but only one is passed on to each offspring

2. Law of Independent Assortment - genes for different traits are inherited independently of each other
3. Law of Dominance - one allele is dominant over the other and will determine the phenotype if present

Punnett Squares

Used to predict the probability of offspring inheriting certain traits based on the genotypes of the parents.

Pedigrees

Used to track the inheritance of traits within a family.

Genetic Disorders

Autosomal Recessive Disorders

- Cystic fibrosis
- Sickle cell anemia
- Phenylketonuria (PKU)

Autosomal Dominant Disorders

- Huntington's disease
- Marfan syndrome

X-Linked Recessive Disorders

- Hemophilia
- Color blindness
- Duchenne muscular dystrophy

Resources

- [National Human Genome Research Institute](#)
- [Khan Academy Genetics Course](#)
- [Genetics Home Reference](#)