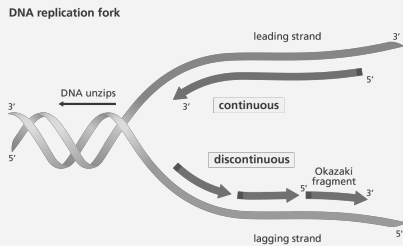
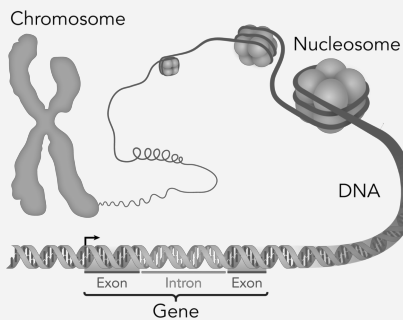


### DNA Replication



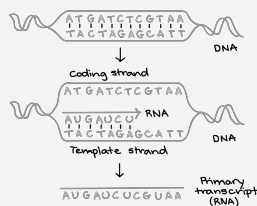
helicases- untwist double helix  
topoisomerase- breaks, swivels, & rejoins  
primer- initial stretch of RNA  
DNA polymerases- adds nucleotides

### Chromosome Structure



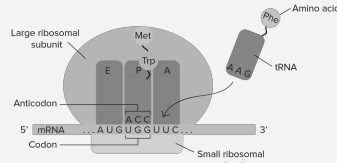
histones make up nucleosomes

### Transcription



-RNA polymerase synthesizes RNA  
-promoter initiates, terminator (bacteria)/polyadenylation sequence (eukaryotes) ends  
-TATA box= crucial to initiation complex  
-mods: 5' cap, poly-A tail, RNA splicing

### Translation



initiation factors- bring components together w/GTP  
elongation factors- add amino acids to chain  
release factors- binds to A site codon & hydrolyzes bond in P site  
processing: protein folding & mods

### Mutations

base-pair substitutions  
replacement of nucleotide w/another; silent=no effect, missense=change 1 amino acid, nonsense=changes amino acid codon to stop codon

insertions & deletions  
additions or losses of nucleotide pairs

### Regulation of Genes

operon  
stretch of DNA required for enzyme production (repressible & inducible)

repressor  
blocks attachment of RNA polymerase

corepressor  
cooperates w/repressor to turn operon off

activator  
stimulates transcription (ex: cAMP)

miRNA, siRNA  
degrades target mRNA, blocks translation

### Biotechnology

restriction enzymes  
cut DNA sequences at palindrome restriction sites

ligase  
seals breaks

vector  
vehicle of DNA to replace or express genetic material

Polymerase Chain Reaction  
produces copies of DNA w/o cells

cDNA  
DNA produced w/ reverse transcriptase

### Viruses

capsid  
protein coat, made of capsomeres

lytic cycle  
phage enters cell, takes control, replicates, lyses cell

lysogenic cycle  
viruses replicate w/o destroying host

prophage  
dormant virus within host genome

retrovirus  
synthesize cDNA from RNA w/ reverse transcriptase

### Bacteria

binary fission  
asexual reproduction (variation w/mutation)

transformation  
recombination of pieces of DNA into a live bacterium

transduction  
bacteriophages carry genes host-host

plasmid  
foreign, small, circular, self-replicating DNA

conjugation  
F plasmid produces sex pilli, allow DNA to transfer