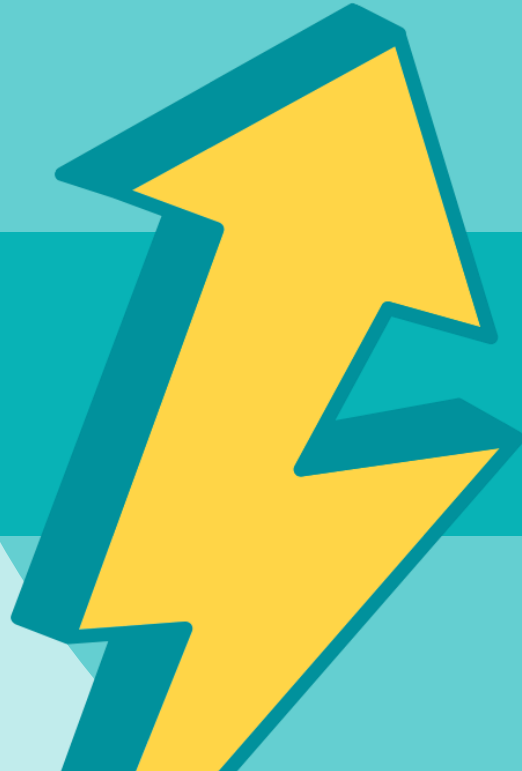


Welcome to Saturday Sessions



AP Biology



AP Biology students are penguins because they are dressed for success!

You are now an AP Bio Penguin!





Favorite Resources

AP Bio Penguins

- @apbiopenguins (Instagram, Twitter, YouTube & TikTok)
- Website: apbiopenguins.weebly.com
- AP Biology Review Guide
- TONS of Review PowerPoints

Additional Resources

- Podcast: @theapsoluterecap
- YouTube: Bozeman Biology
- TikTok: Winnie Sloan @mrssloanbiology
- Review Book: Barron's (7th Edition)



Exam Options

Paper Administration

- May 14th @ 8am Local
- Traditional Exam: 60 MC/2 Long + 4 Short FRQ

Digital Administration

- May 27th @ 12pm Eastern
OR
- June 11th @ 12pm Eastern
- Traditional Exam: 60 MC/2 Long + 4 Short FRQ
- Students will not be asked to draw or graph as part of their response (#2 or #5)



Pace Yourself
Present Practice
Persevere
Penguin





Unit 1: Chemistry of Life

Big Topics

- Macromolecules

8 – 11% of the AP Biology Exam

Based on 2020 Practice Exams – that's 5.7 questions

BUT WAIT THERE'S MORE!



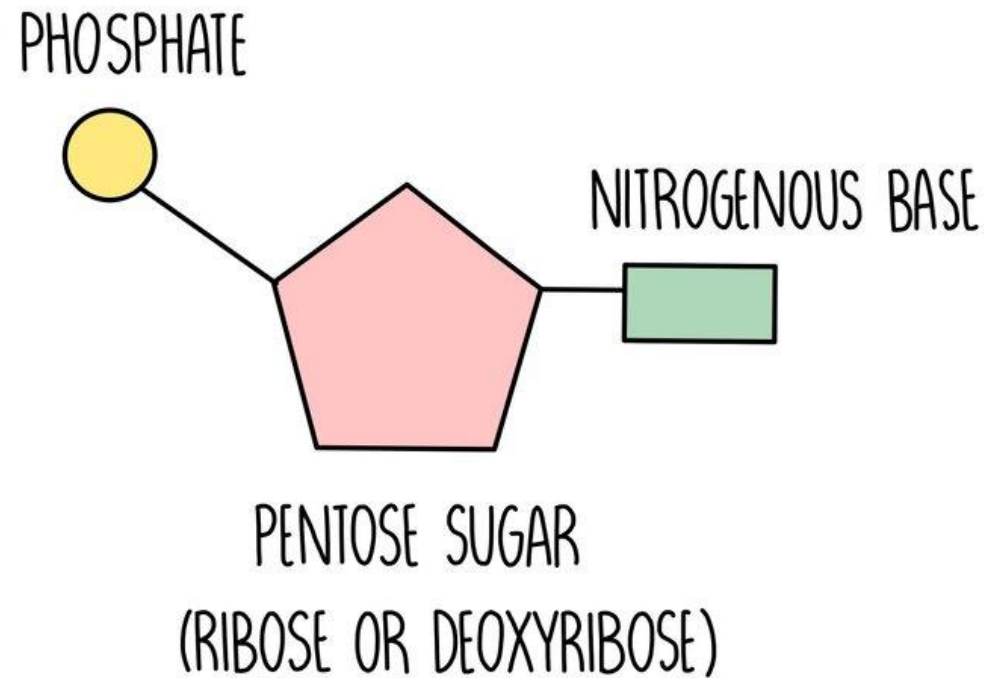


Nucleic Acids

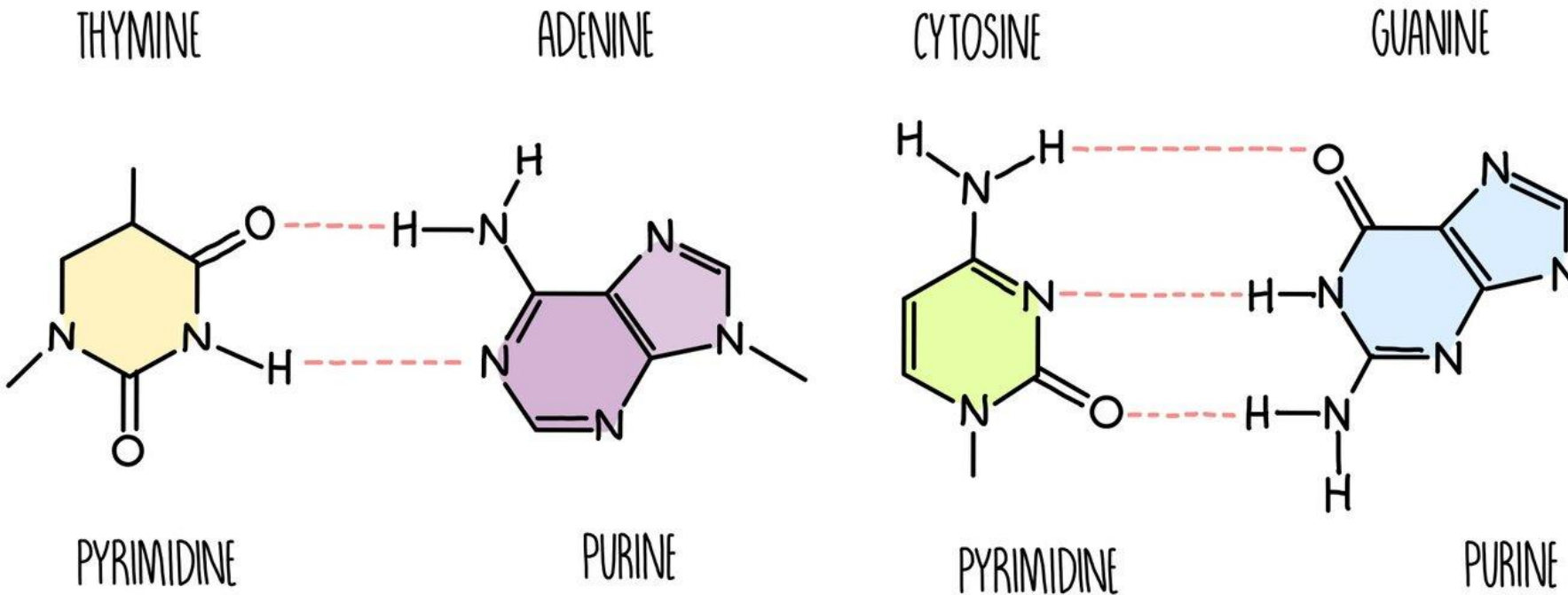
Big Ideas:

- Structure?
- DNA vs . RNA?
- Directionality?
- Prokaryote vs. Eukaryote?
- Location?
- Replication?
- Transcription?
- Cell Division?

Nucleic Acids: Structure



Nucleic Acids: Structure





Nucleic Acids: DNA vs. RNA

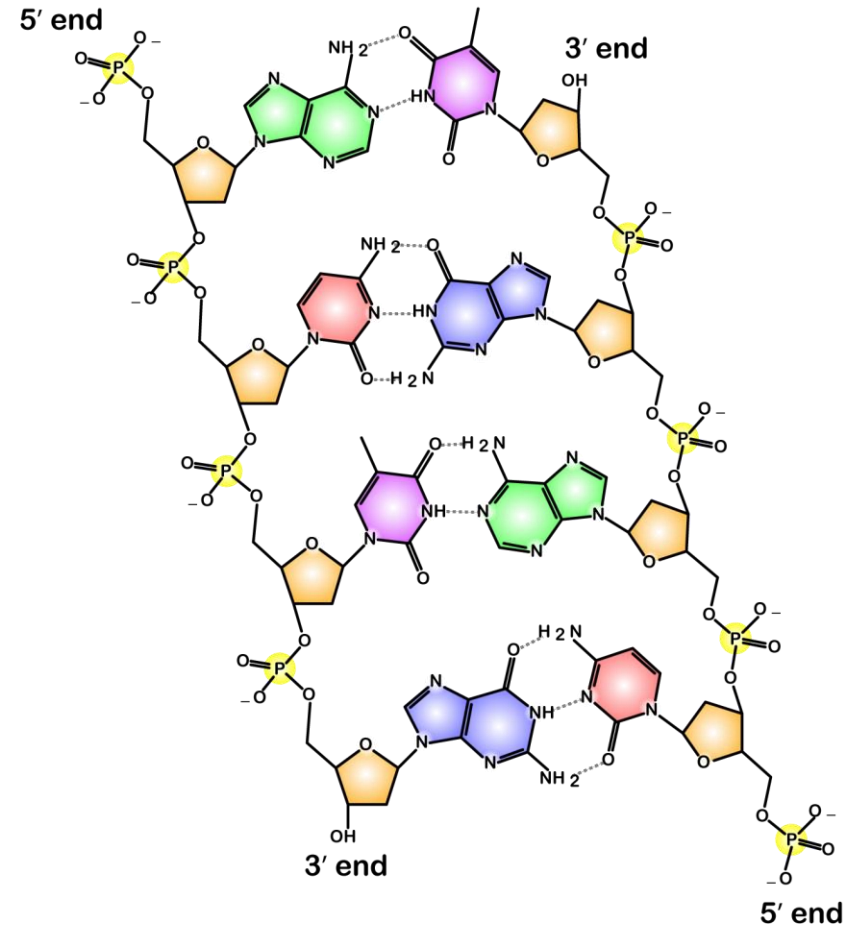
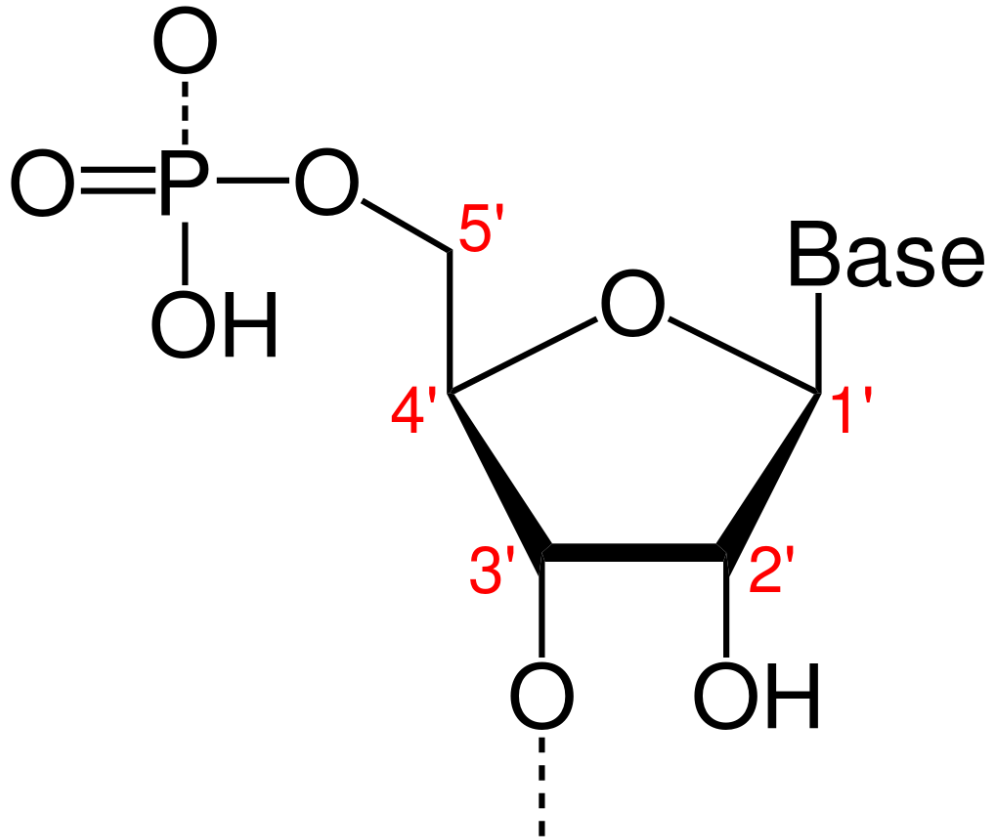
DNA

- Sugar: Deoxyribose
- Nitrogenous Bases:
A, T, C, G
- Double Stranded

RNA

- Sugar: Ribose
- Nitrogenous Bases:
A, U, C, G
- Single Stranded

Nucleic Acids: Directionality





Nucleic Acids: Pro- vs Eu-

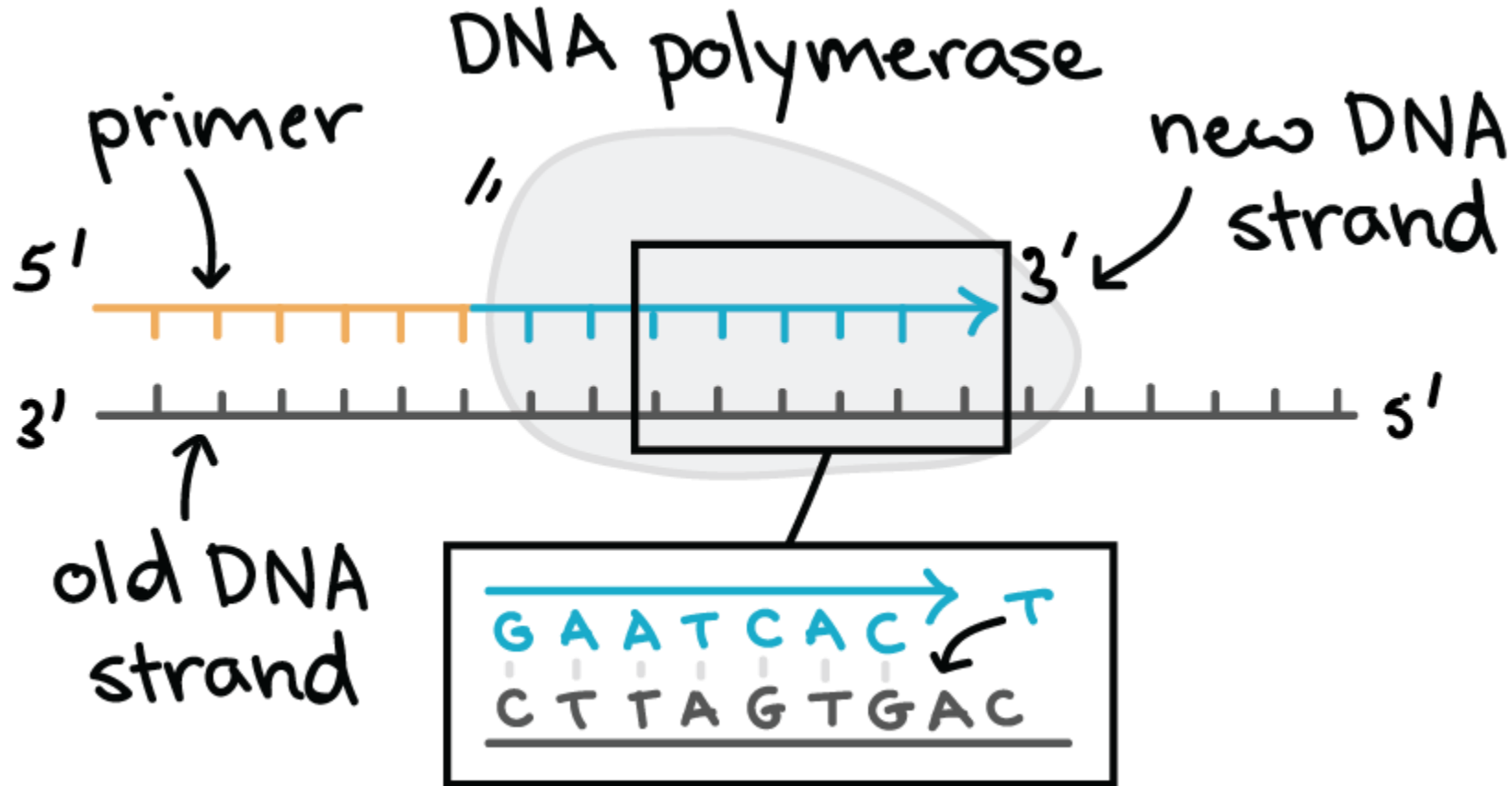
Prokaryotes

- Circular DNA
- Location: Nucleoid
- T&T: Simultaneously
- Introns: No

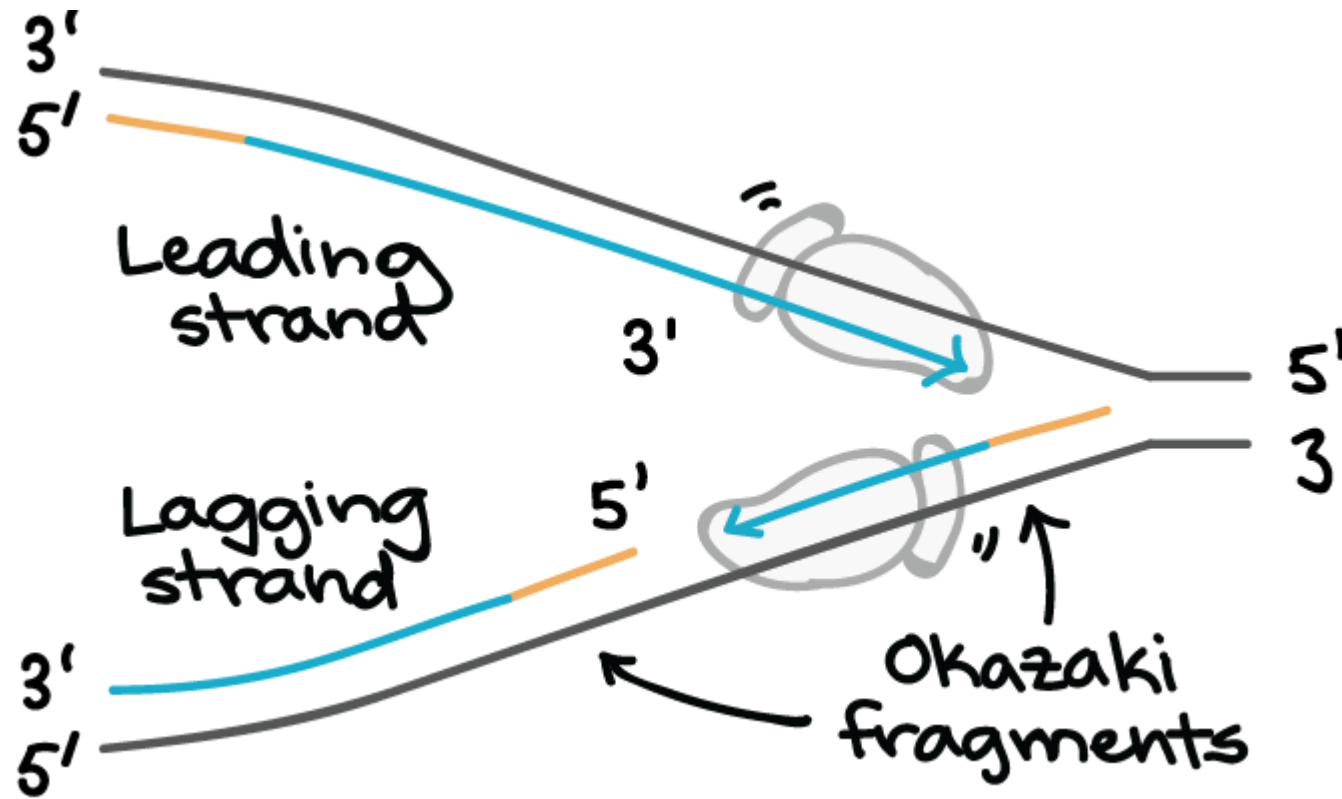
Eukaryotes

- Linear DNA
- Location: Nucleus, Mitochondria, Chloroplast
- T&T: Separated
- Introns: Yes

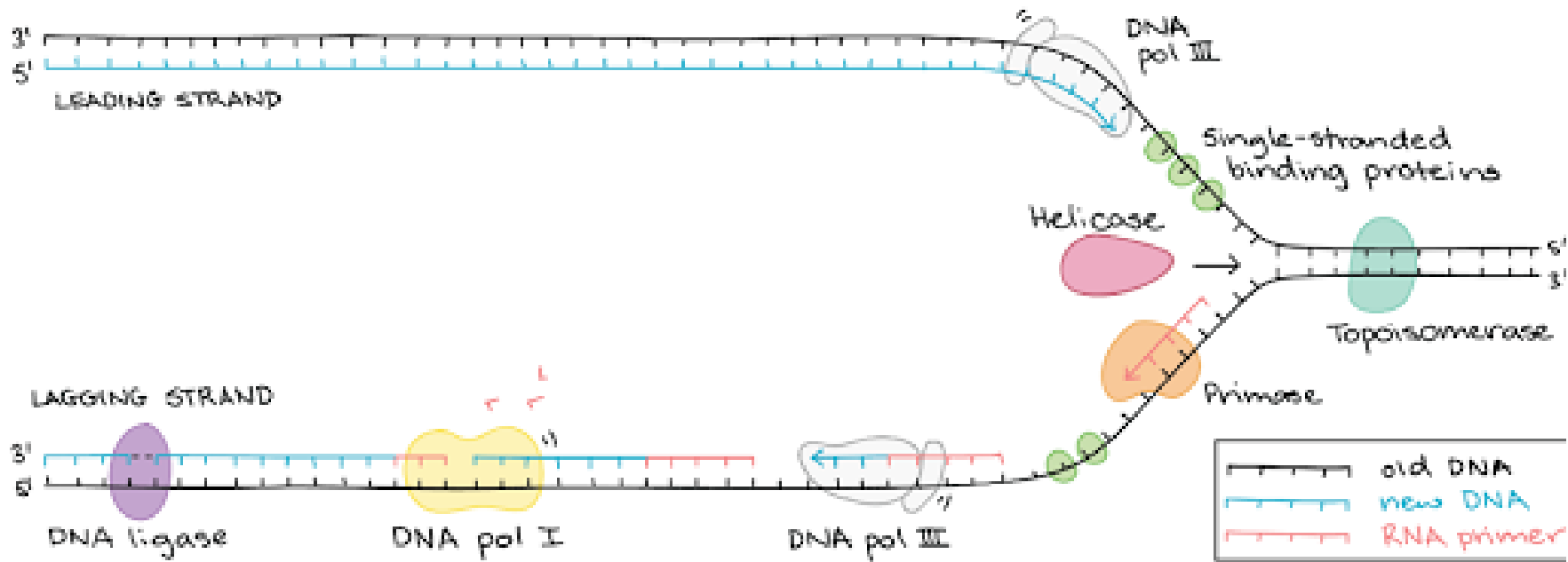
Nucleic Acids: Replication



Nucleic Acids: Replication

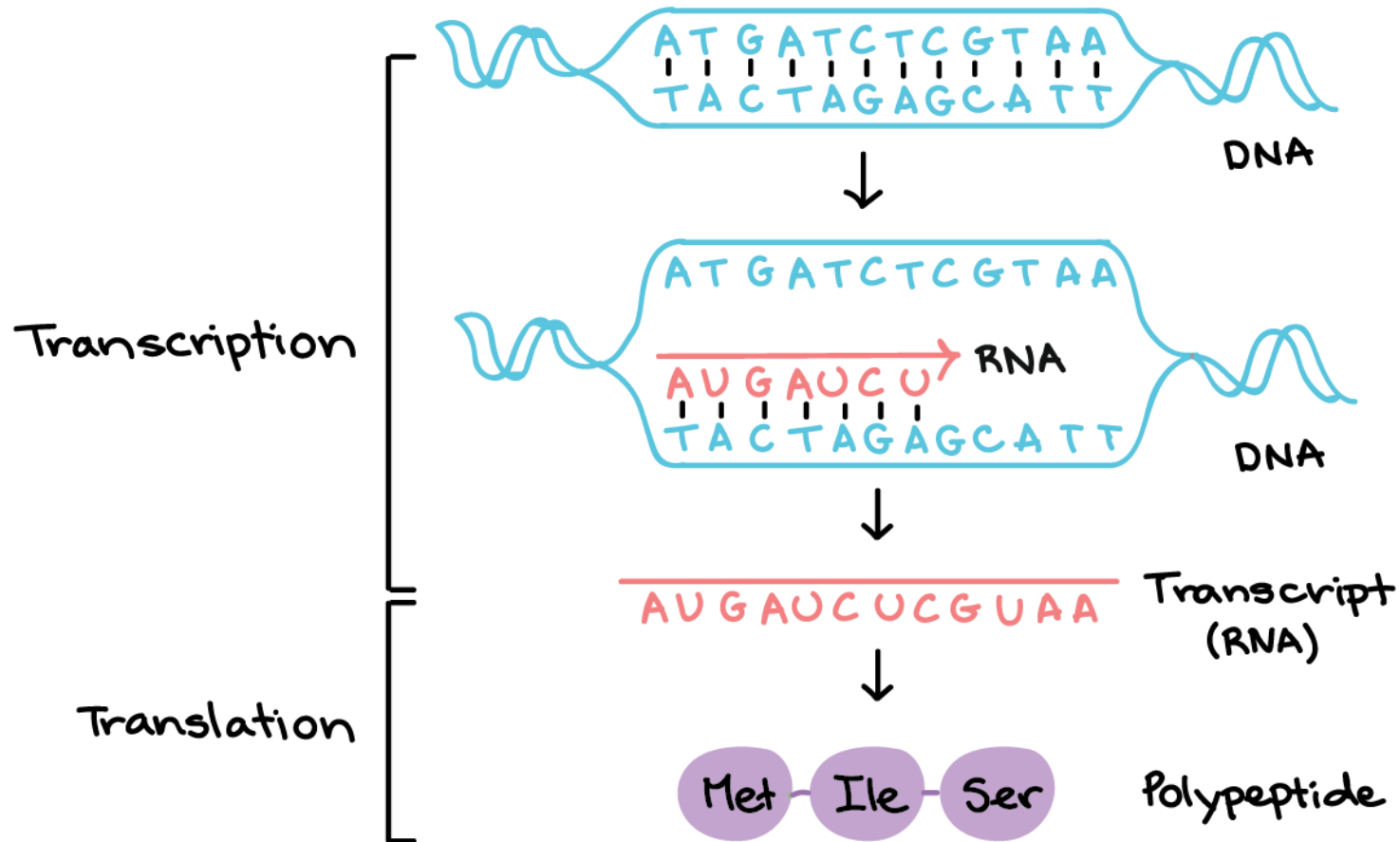


Nucleic Acids: Replication

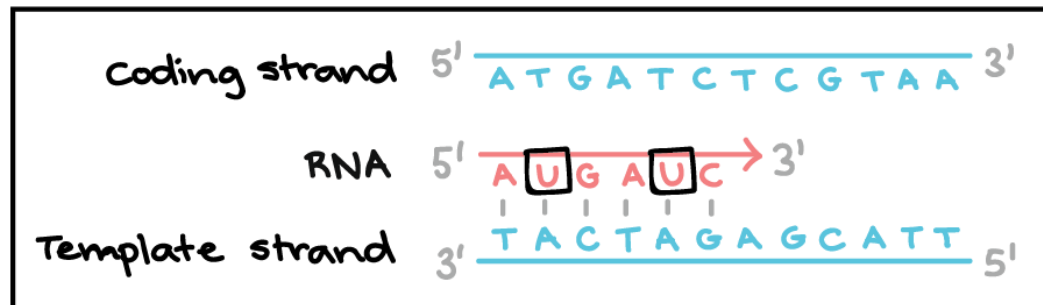
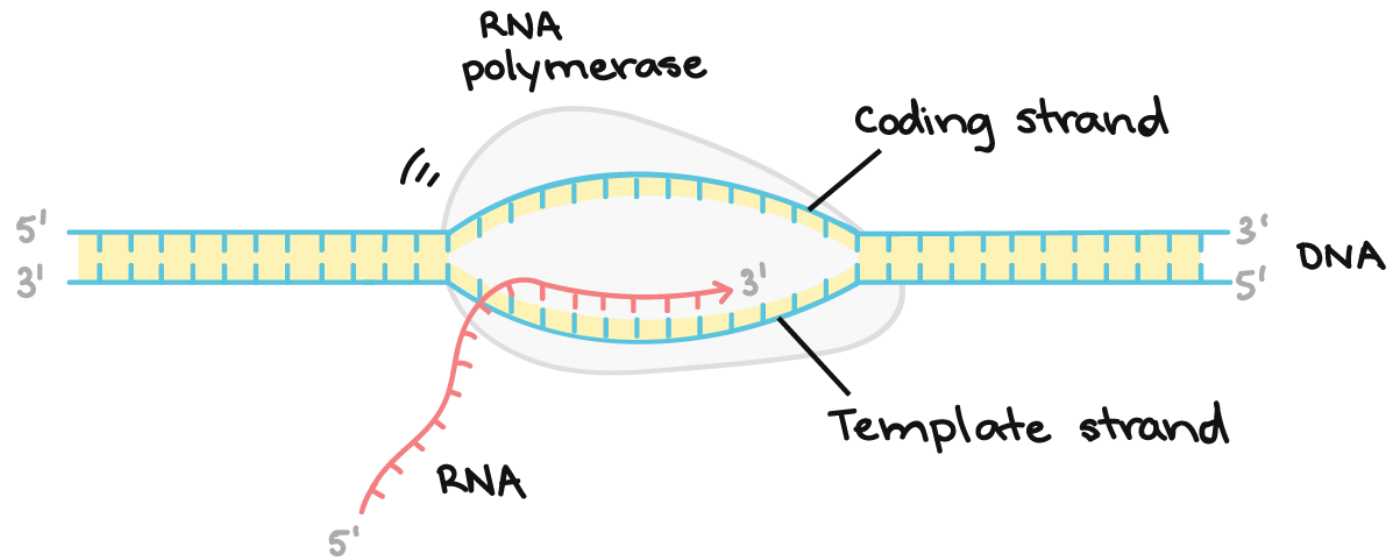




Nucleic Acids: Central Dogma

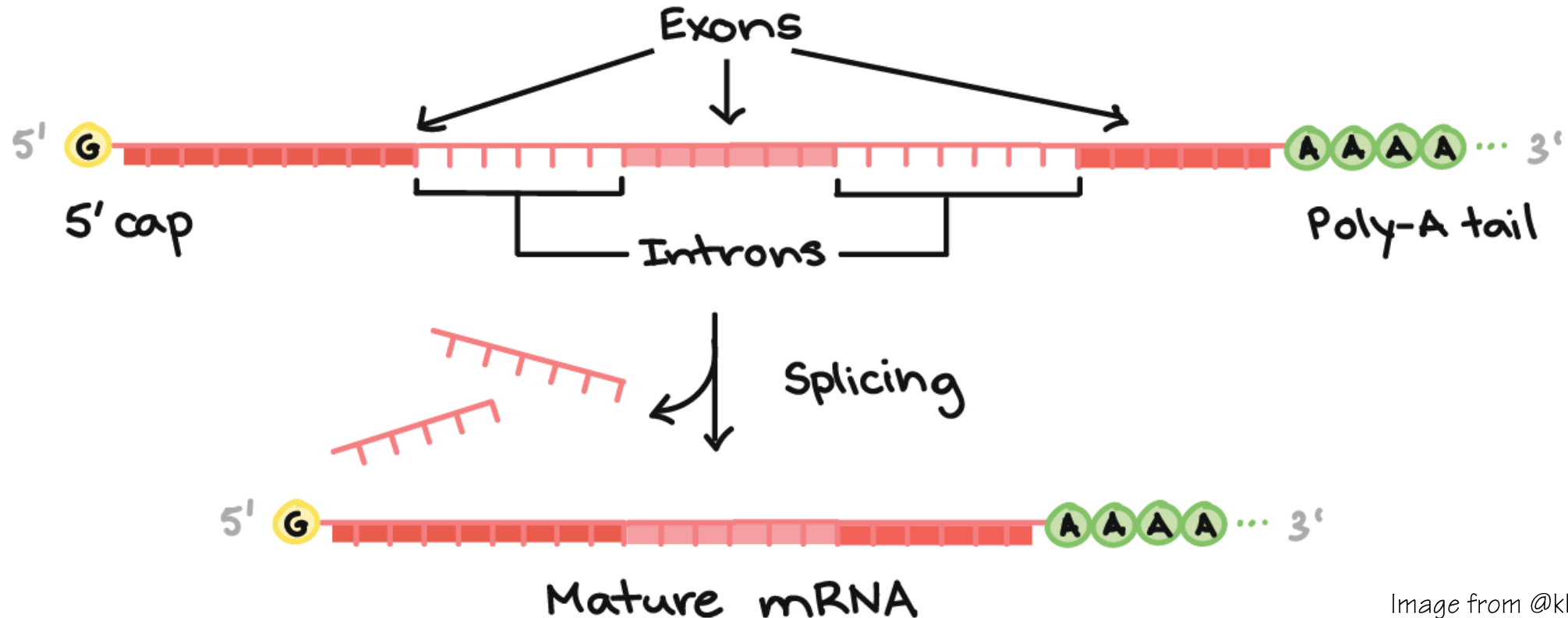


Nucleic Acids: Transcription

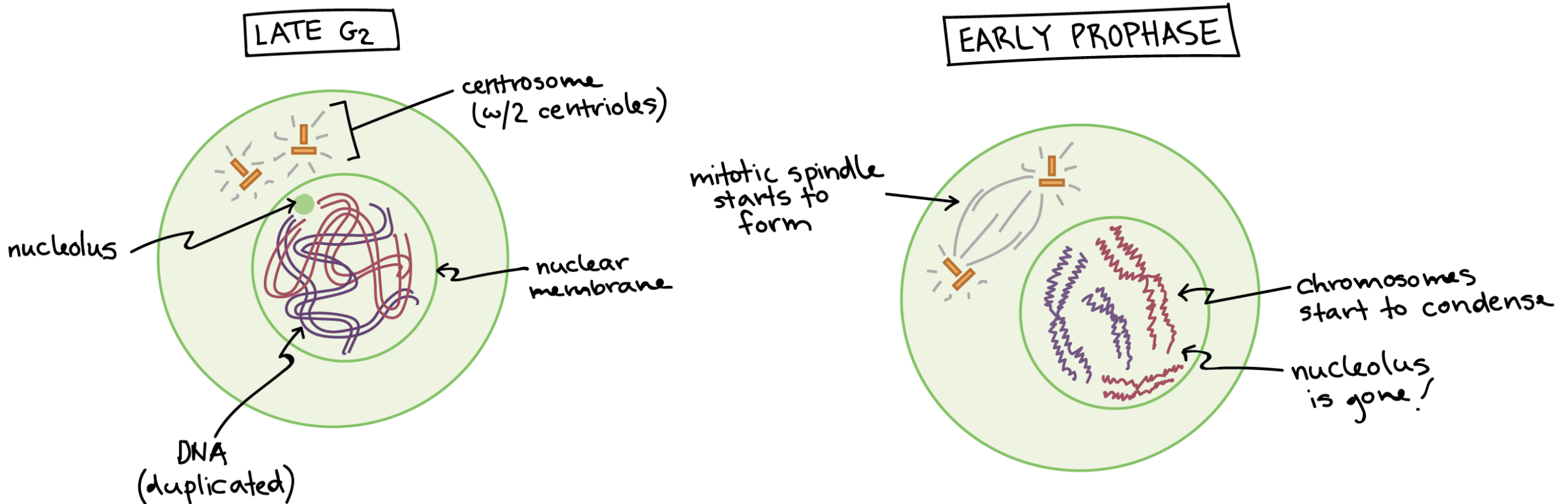




Nucleic Acids: Post-Transcription Modification

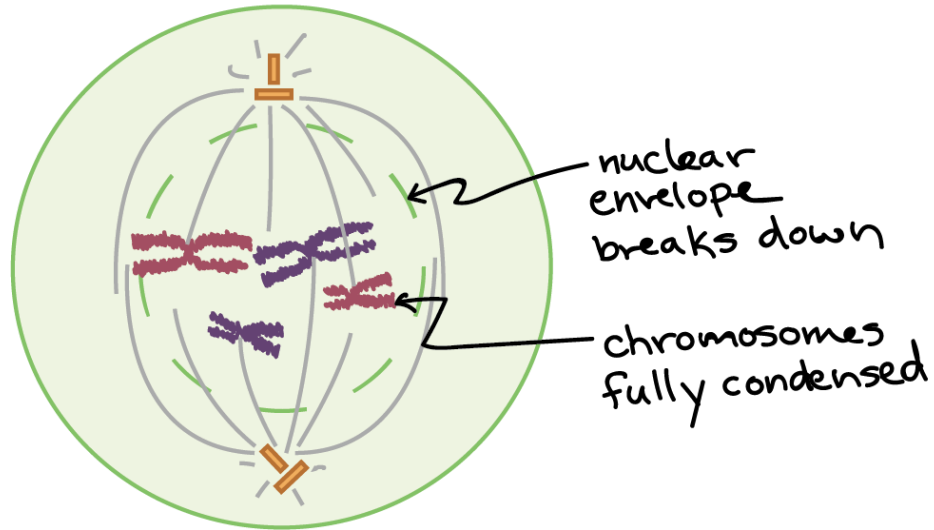


Nucleic Acids: Cell Division

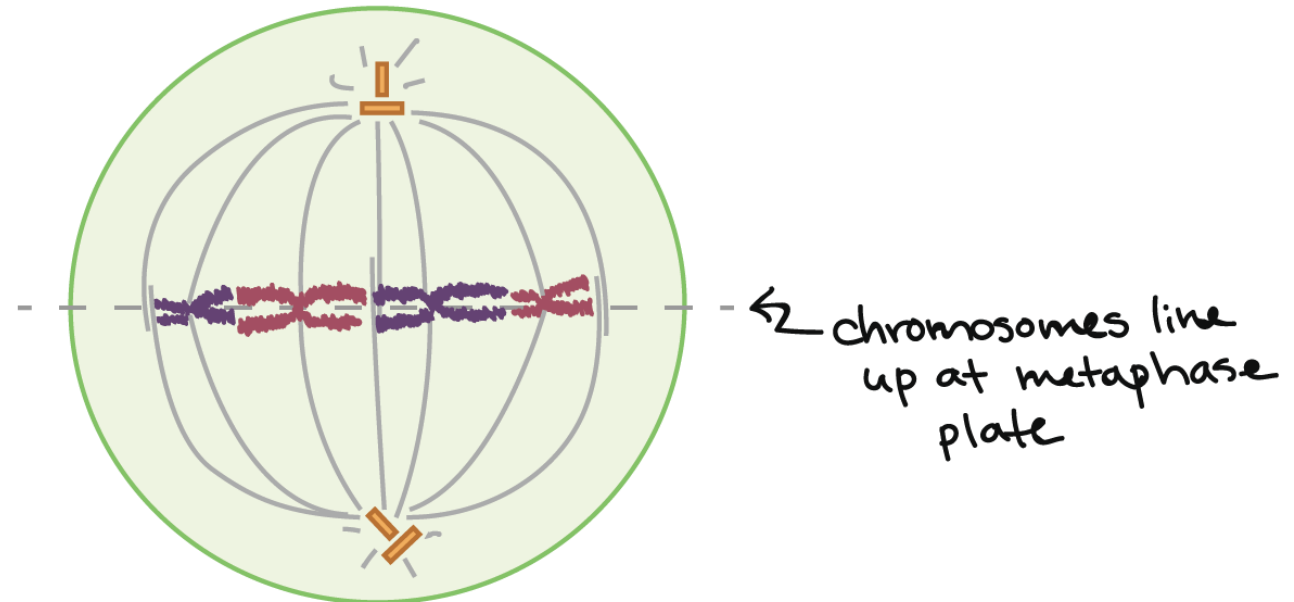


Nucleic Acids: Cell Division

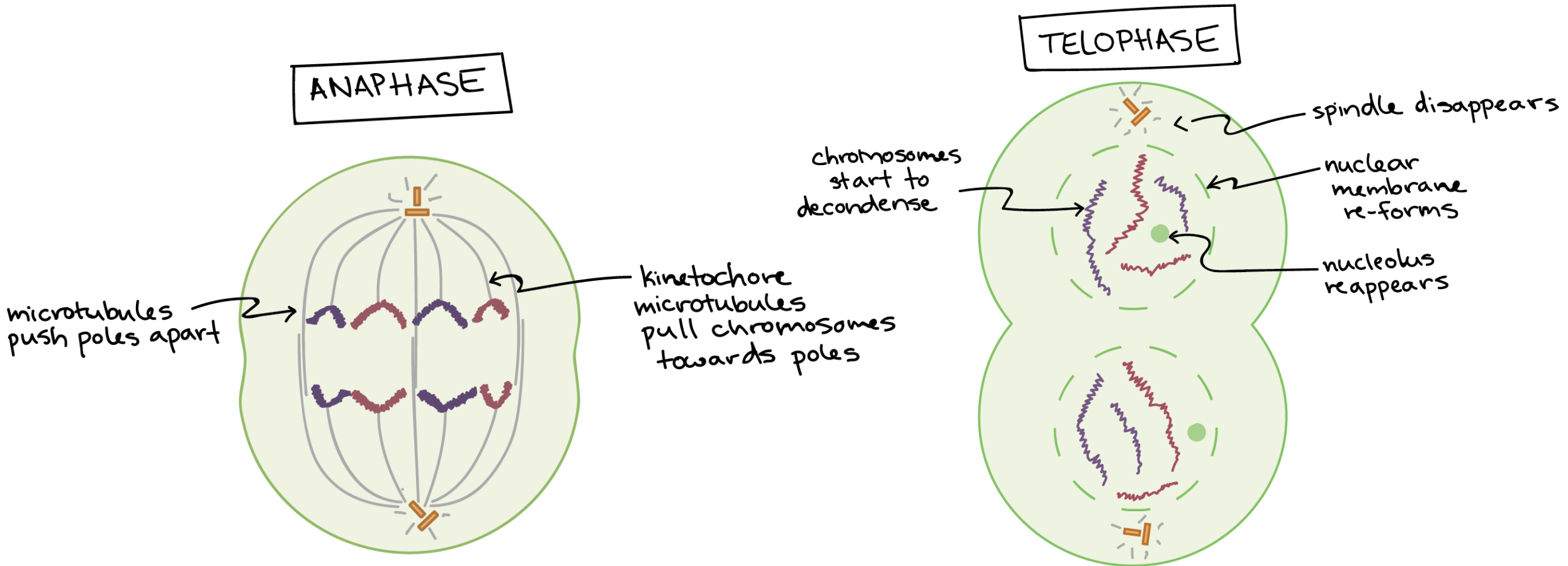
LATE PROPHASE
(PROMETAPHASE)



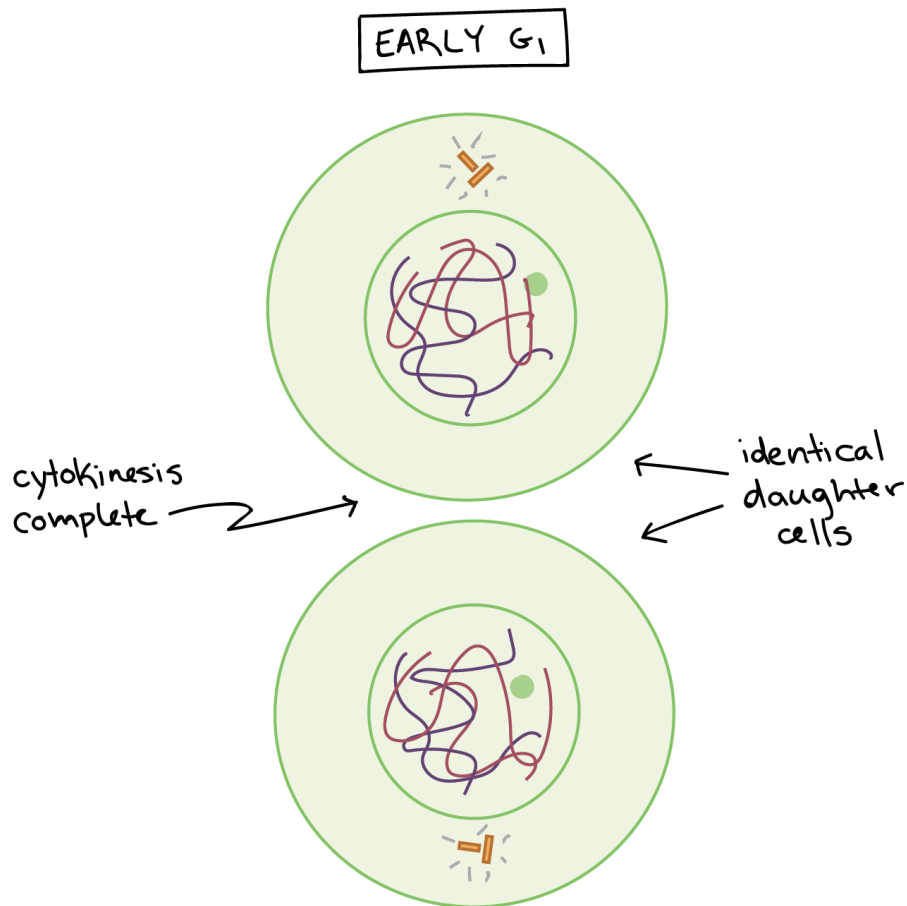
METAPHASE



Nucleic Acids: Cell Division



Nucleic Acids: Cell Division



Mitosis

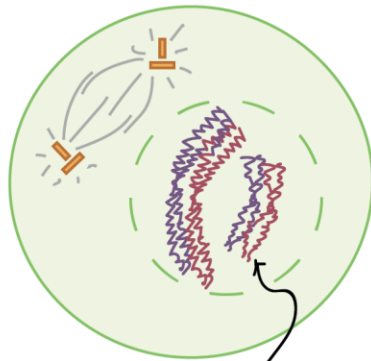
- PMAT
- Parent: $2n$
- Daughter: $2n$
- Genetically Identical
- 1 Division, 1 Replication
- Metaphase/Anaphase: Sister Chromatids

Nucleic Acids: Cell Division

PHASES OF MEIOSIS I

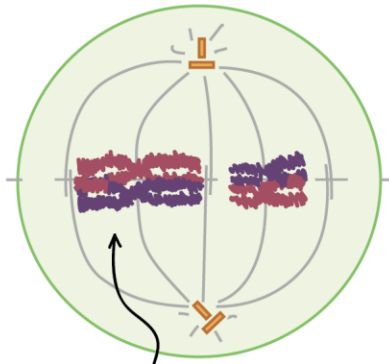
Prophase I

starting cell is diploid ($2n = 4$)



homologous chromosomes pair up and exchange fragments (crossing over)

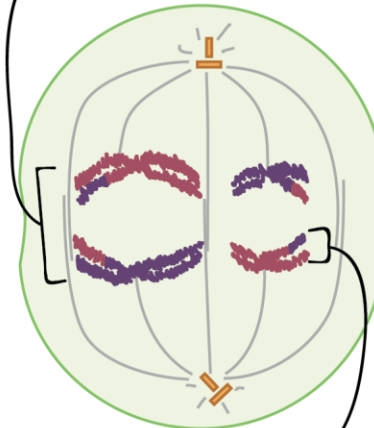
Metaphase I



homologue pairs line up at the metaphase plate

Anaphase I

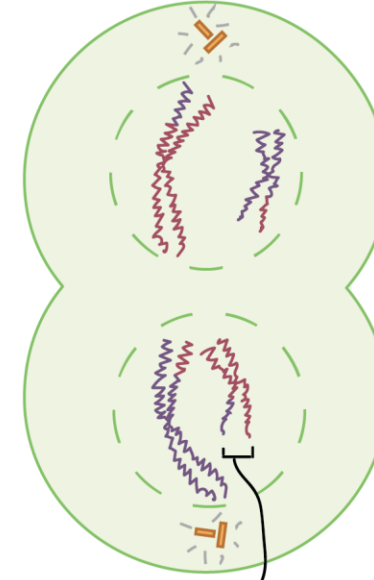
homologues separate to opposite ends of the cell



sister chromatids stay together

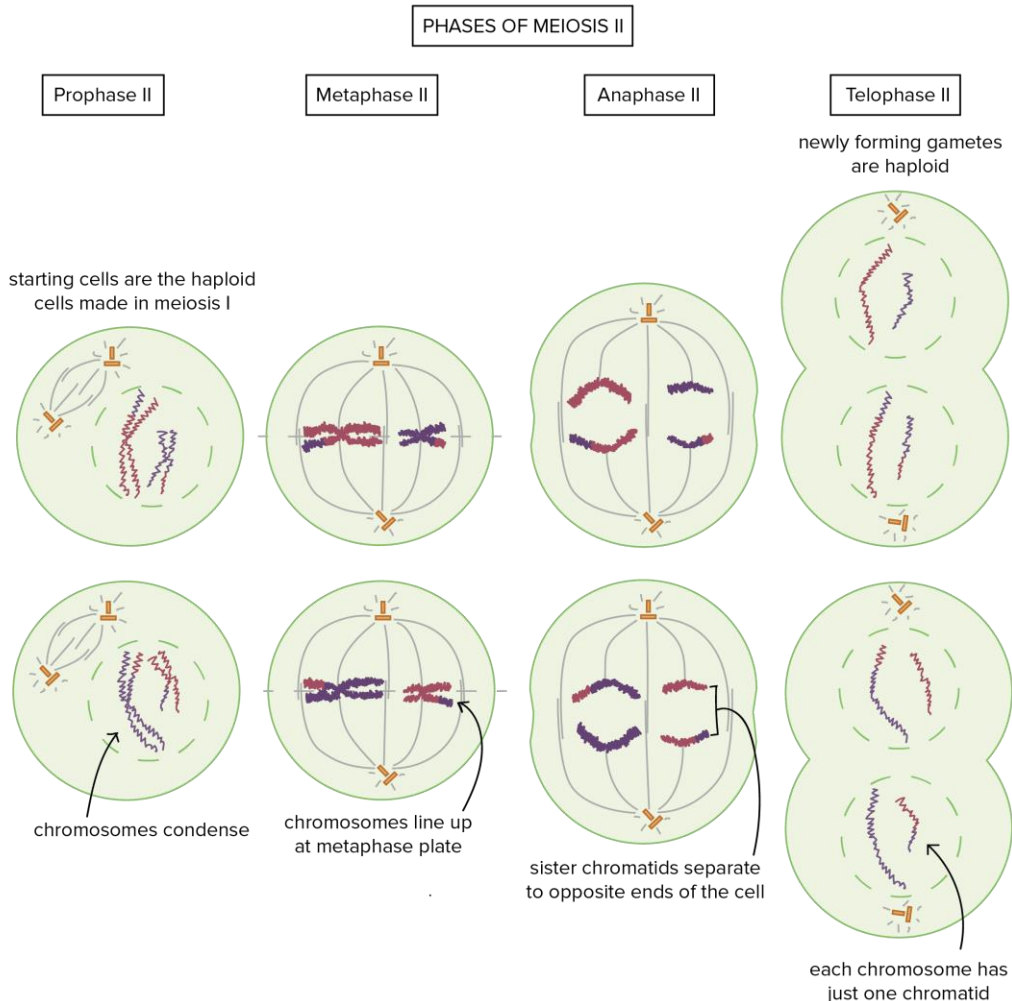
Telophase I

newly forming cells are haploid ($n = 2$)



each chromosome has two (non-identical) sister chromatids

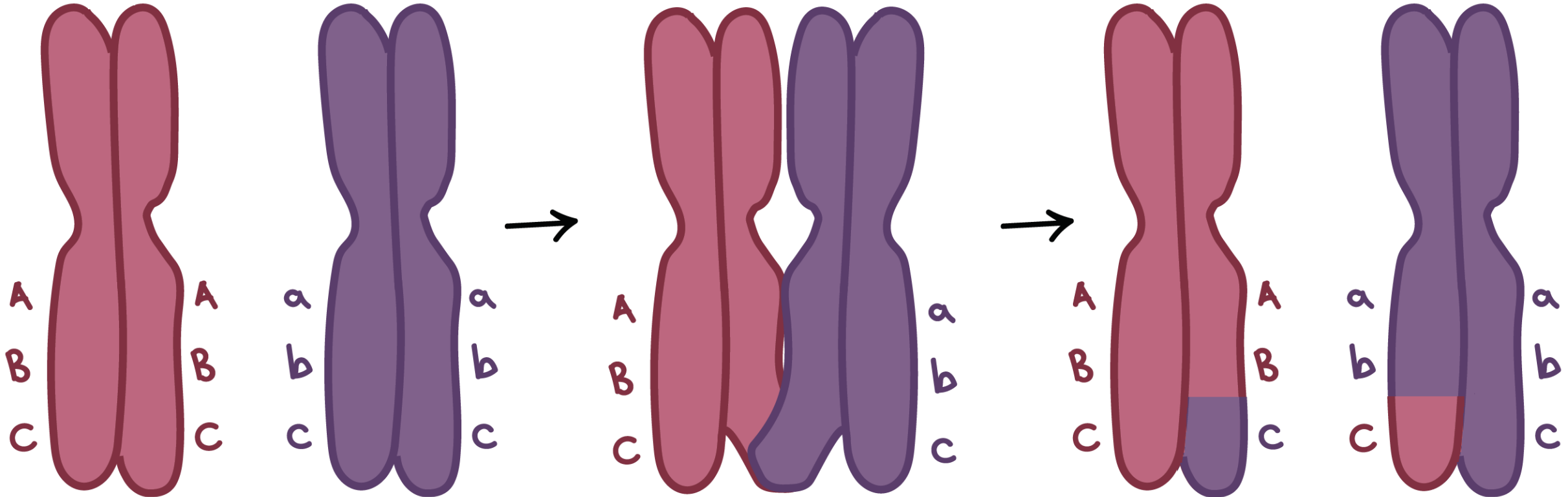
Nucleic Acids: Cell Division



Meiosis

- PMAT
- Parent: $2n$
- Daughter: n
- Genetically Distinct
- 2 Division, 1 Replication
- M1/A1: Homologous Chromosomes
- M2/A2: Sister Chromatids

Nucleic Acids: Cell Division





Ms. Warren – Muscatine HS
Karen Jill Hager – Mesquite HS
Ms. Stojanova – Lake Howell HS
Ms. Rhinehart





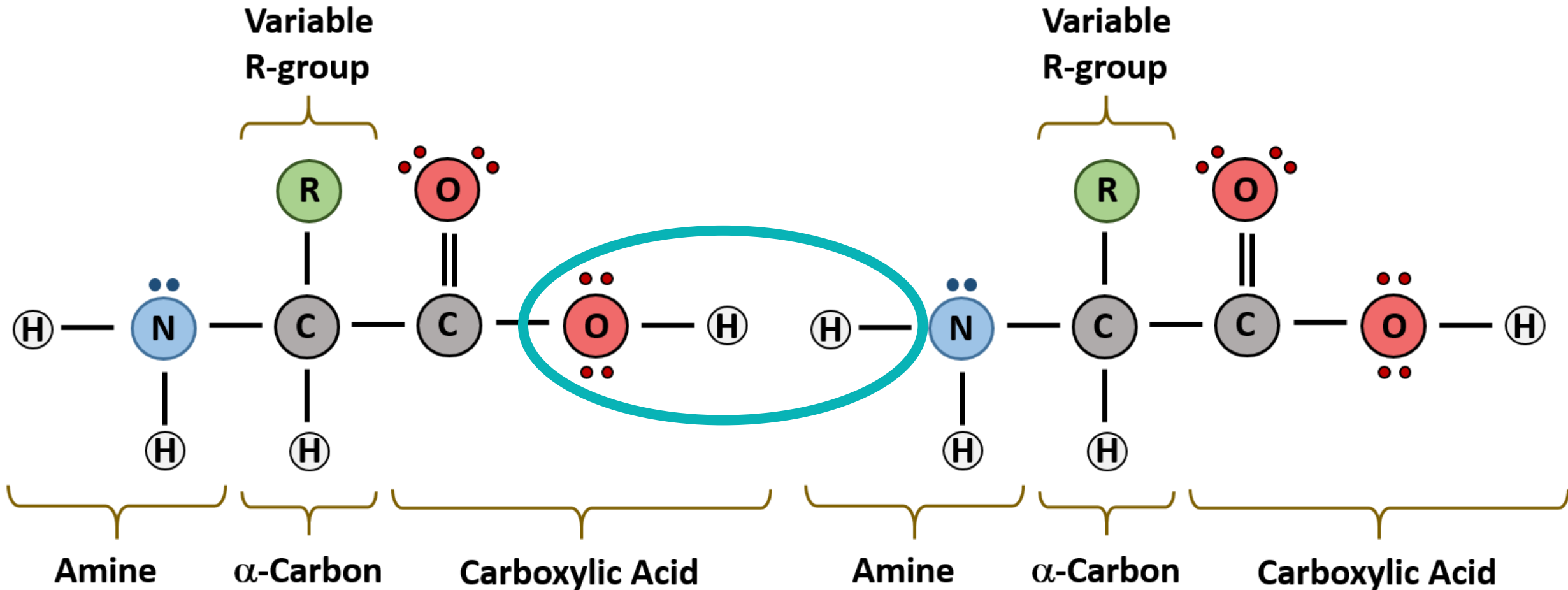
Proteins

Big Ideas:

- Structure?
- Directionality?
- Translation?
- Ribosome Locations/Protein Secretion?
- Genetics?

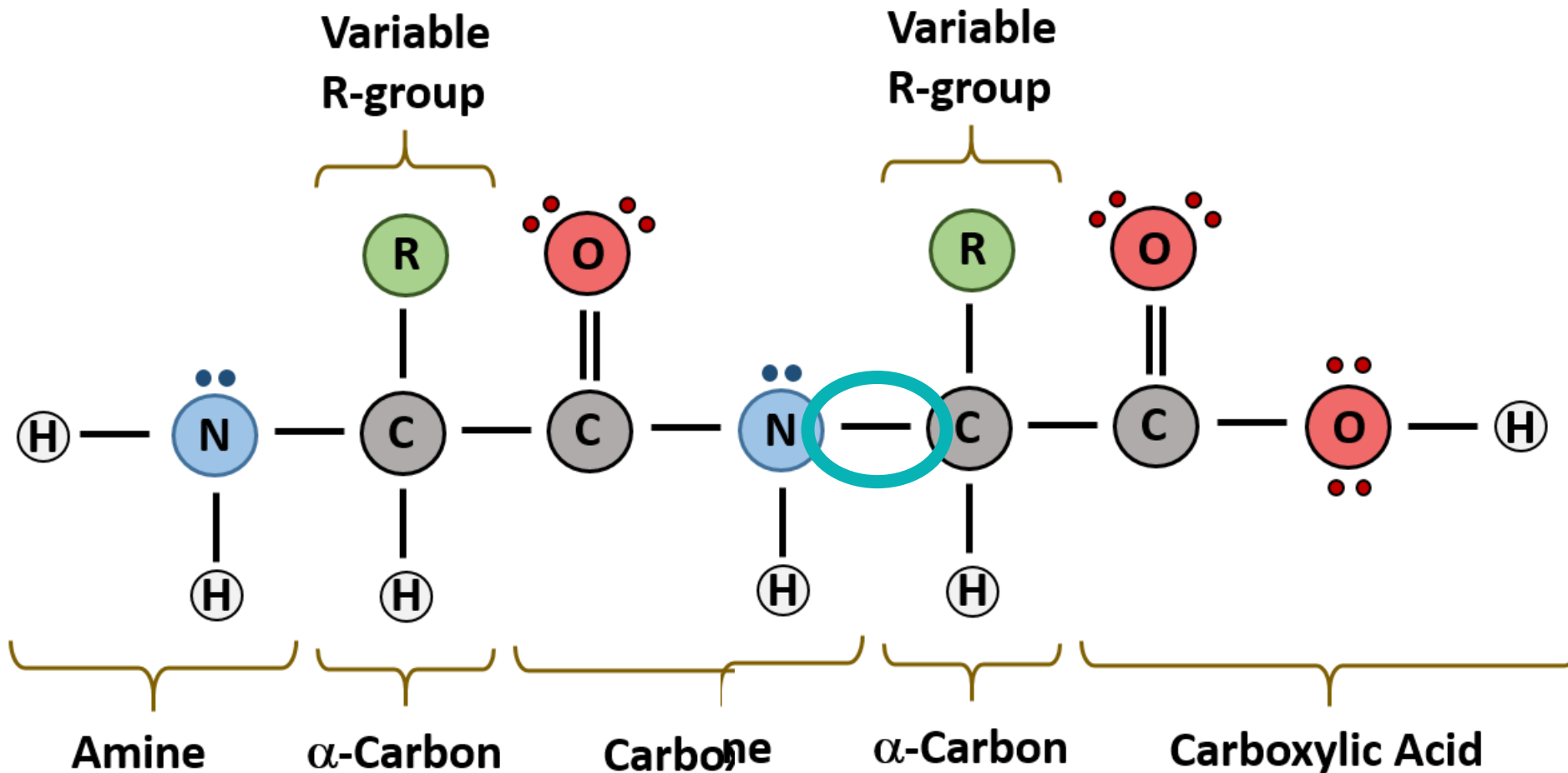


Proteins: Structure

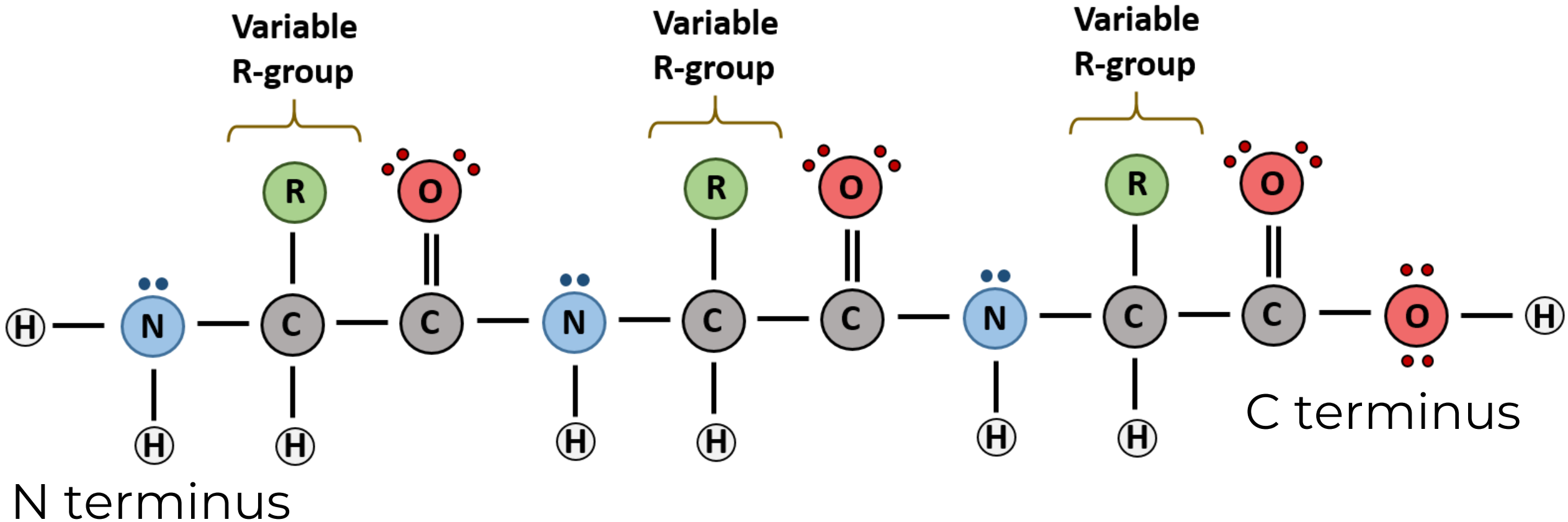




Proteins: Structure



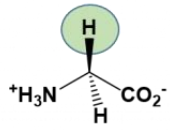
Proteins: Directionality



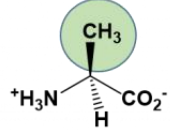


Proteins: Structure

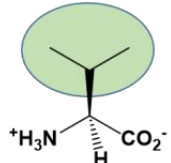
Nonpolar (Hydrophobic) Amino Acids



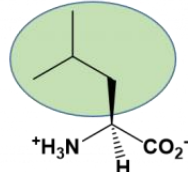
Glycine
Gly, G



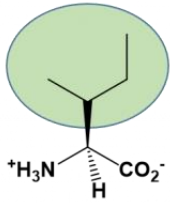
Alanine
Ala, A



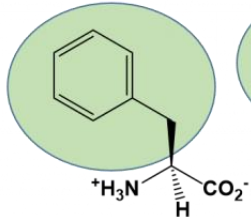
Valine
Val, V



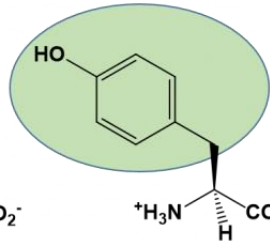
Leucine
Leu, L



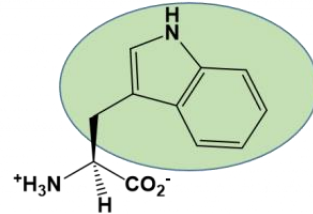
Isoleucine
Ile, I



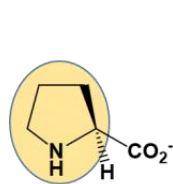
Phenylalanine
Phe, F



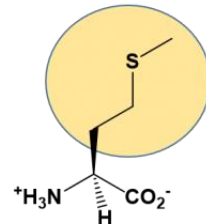
Tyrosine
Tyr, Y



Tryptophan
Trp, W

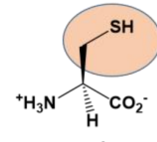


Proline
Pro, P

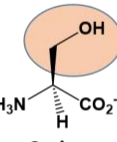


Methionine
Met, M

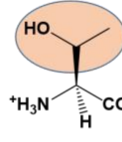
Polar (Hydrophilic) Amino Acids



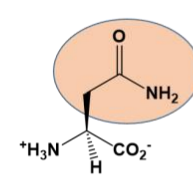
Cysteine
Cys, C



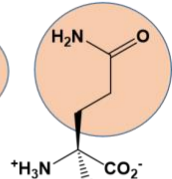
Serine
Ser, S



Threonine
Thr, T

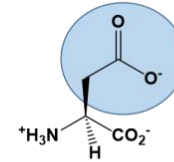


Asparagine
Asn, N

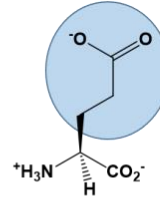


Glutamine
Gln, Q

Acidic Amino Acids

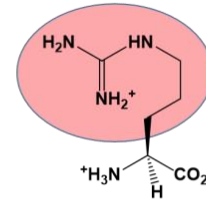


Aspartic Acid
Asp, D

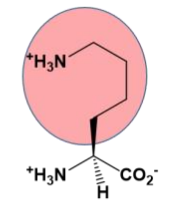


Glutamic Acid
Glu, E

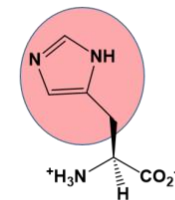
Basic Amino Acids



Arginine
Arg, R



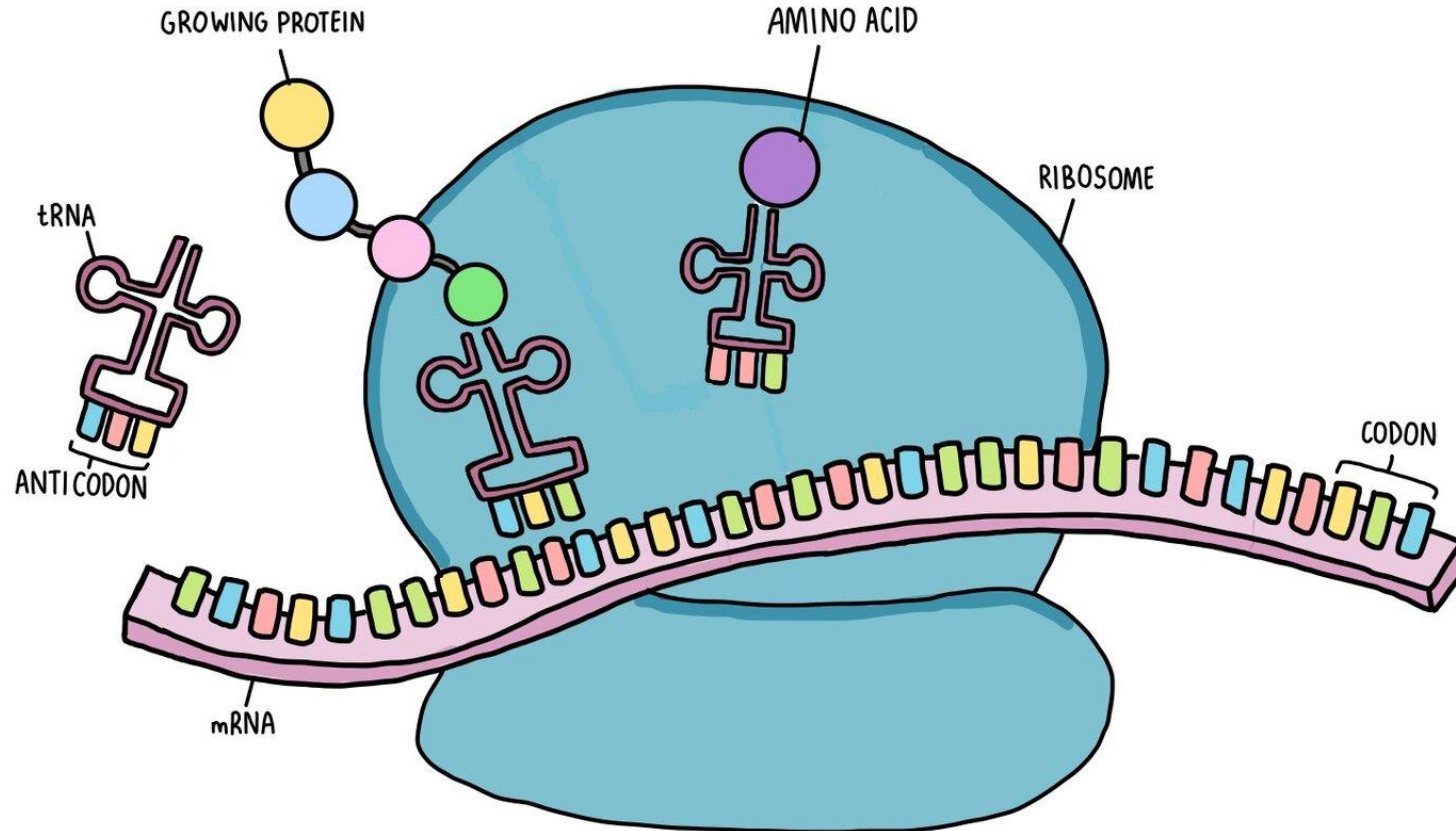
Lysine
Lys, K



Histidine
His, H



Proteins: Translation











Proteins: Ribosomes

- Free Ribosomes → Cytosolic Proteins
- Bound Ribosomes → Membrane Proteins & Proteins for Secretion
- Pathway for Secretion:
 - mRNA binds to ribosome in cytosol
 - ribosome binds to Rough ER
 - Golgi bodies
 - Plasma Membrane



Proteins: Genetics

Relationship among alleles of a single gene	Description	Example
Complete dominance of one allele	Heterozygous phenotype same as that of homozygous dominant	PP  Pp 
Incomplete dominance of either allele	Heterozygous phenotype intermediate between the two homozygous phenotypes	   $C^R C^R$ $C^R C^W$ $C^W C^W$
Codominance	Both phenotypes expressed in heterozygotes	$I^A I^B$ 

Can we do some practice problems?





Proteins: Genetics

Relationship among alleles of a single gene	Description	Example
Multiple alleles	In the population, some genes have more than two alleles	ABO blood group alleles I^A, I^B, i
Pleiotropy	One gene affects multiple phenotypic characters	Sickle-cell disease



I have been waiting
patiently, but ...

Is it time for my treat now?





Lipids

Big Ideas:

- 3 Types?
- Structure of Plasma Membrane?
- Membrane Transport?



Lipids: Types

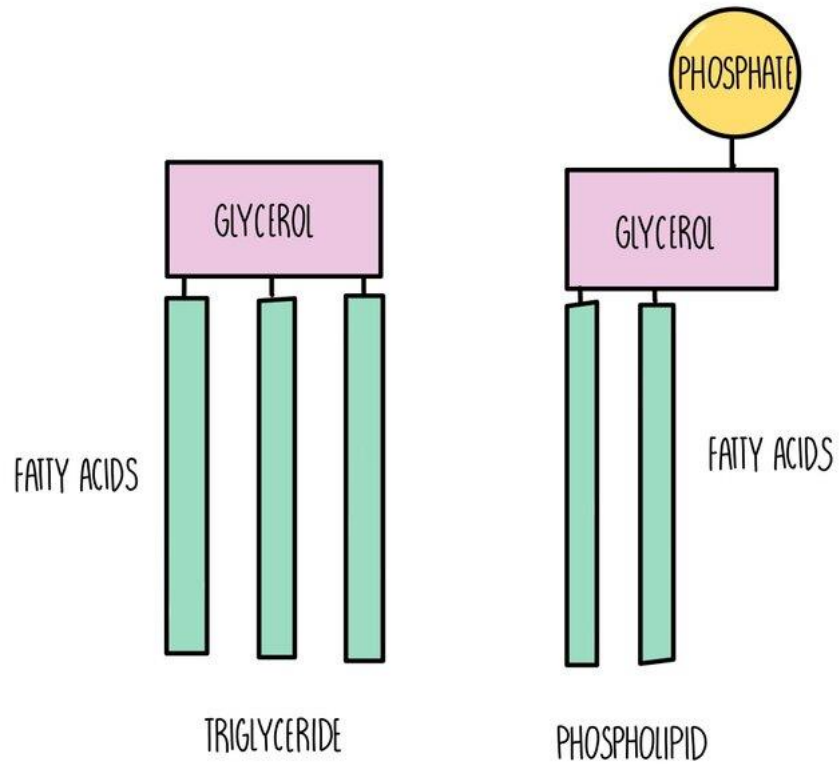


Image from @thesciencehive

Example of Steroid

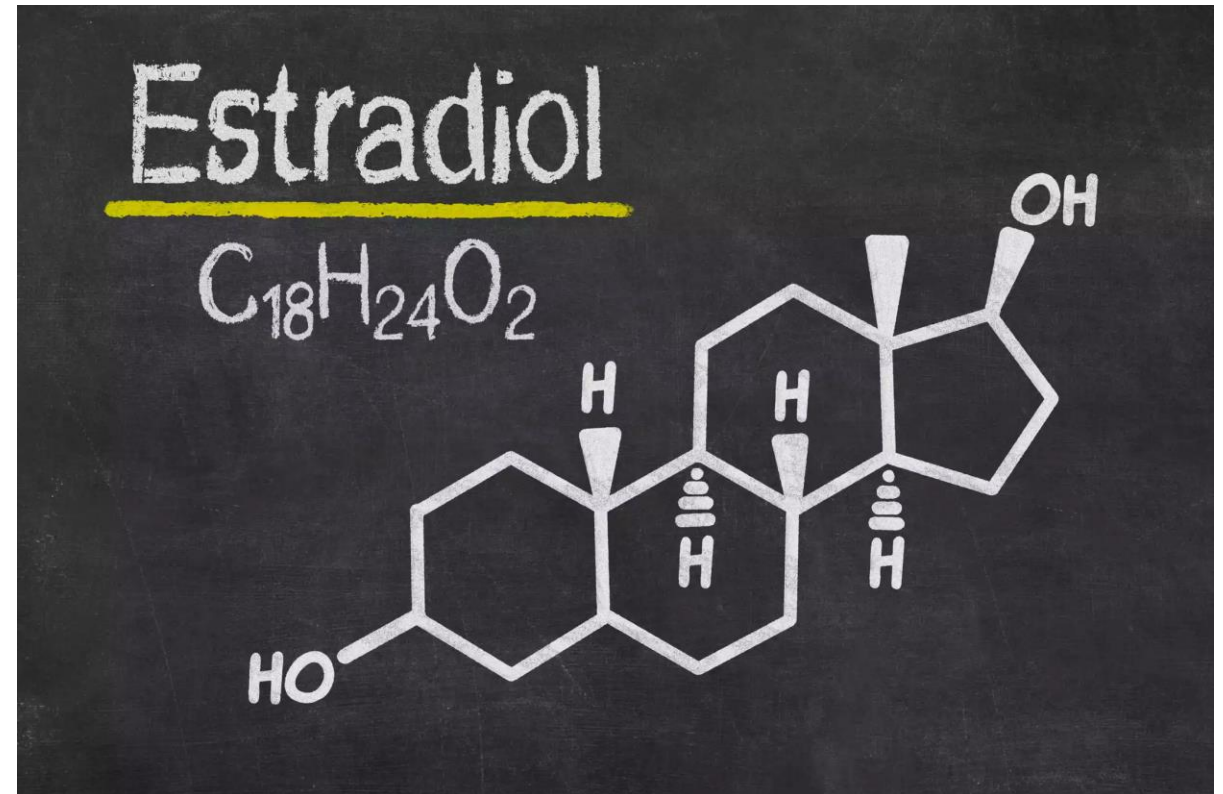
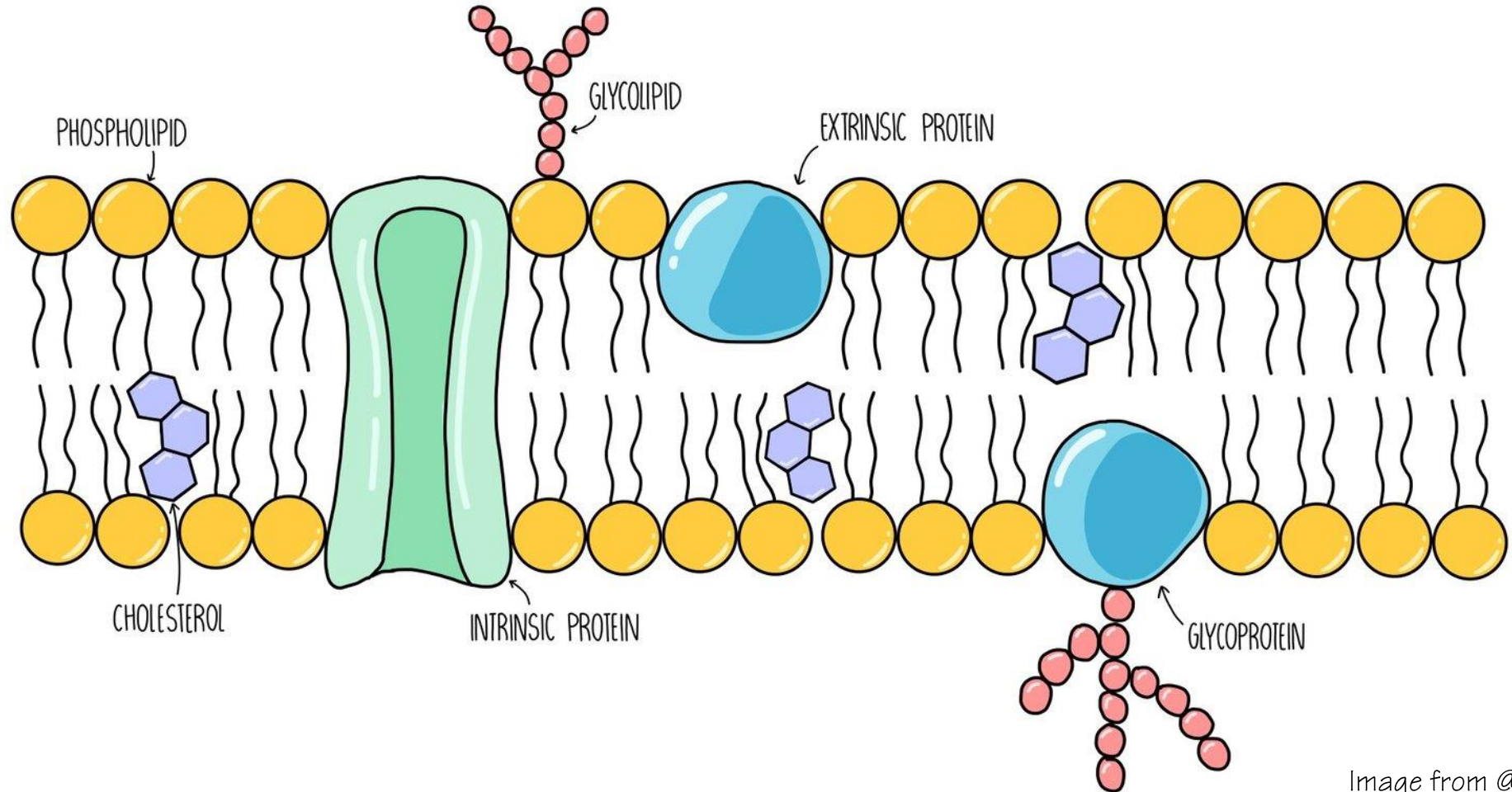
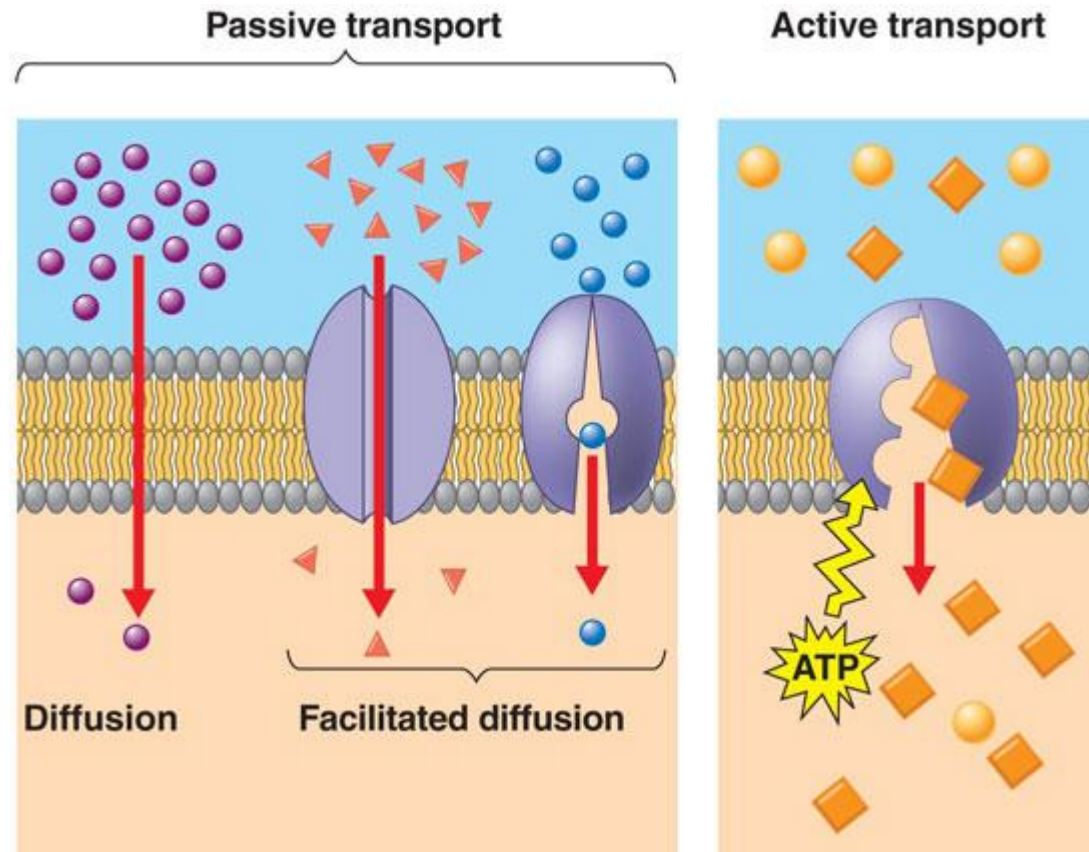


Image from Thought Co.

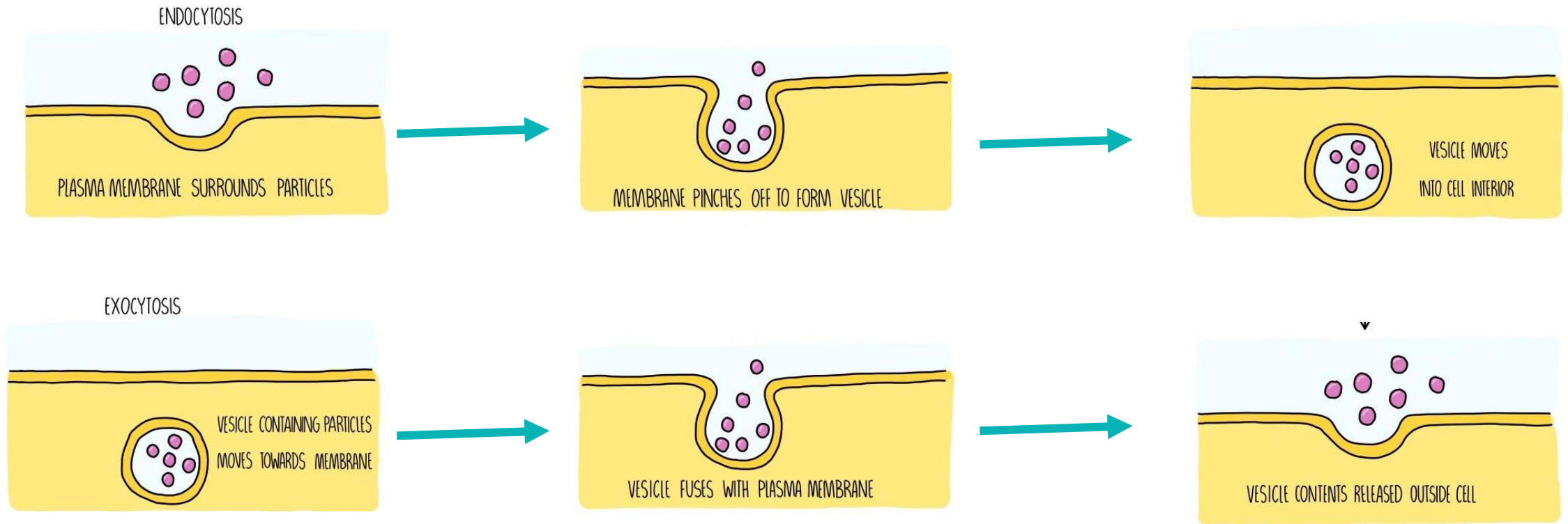
Lipids: Plasma Membrane



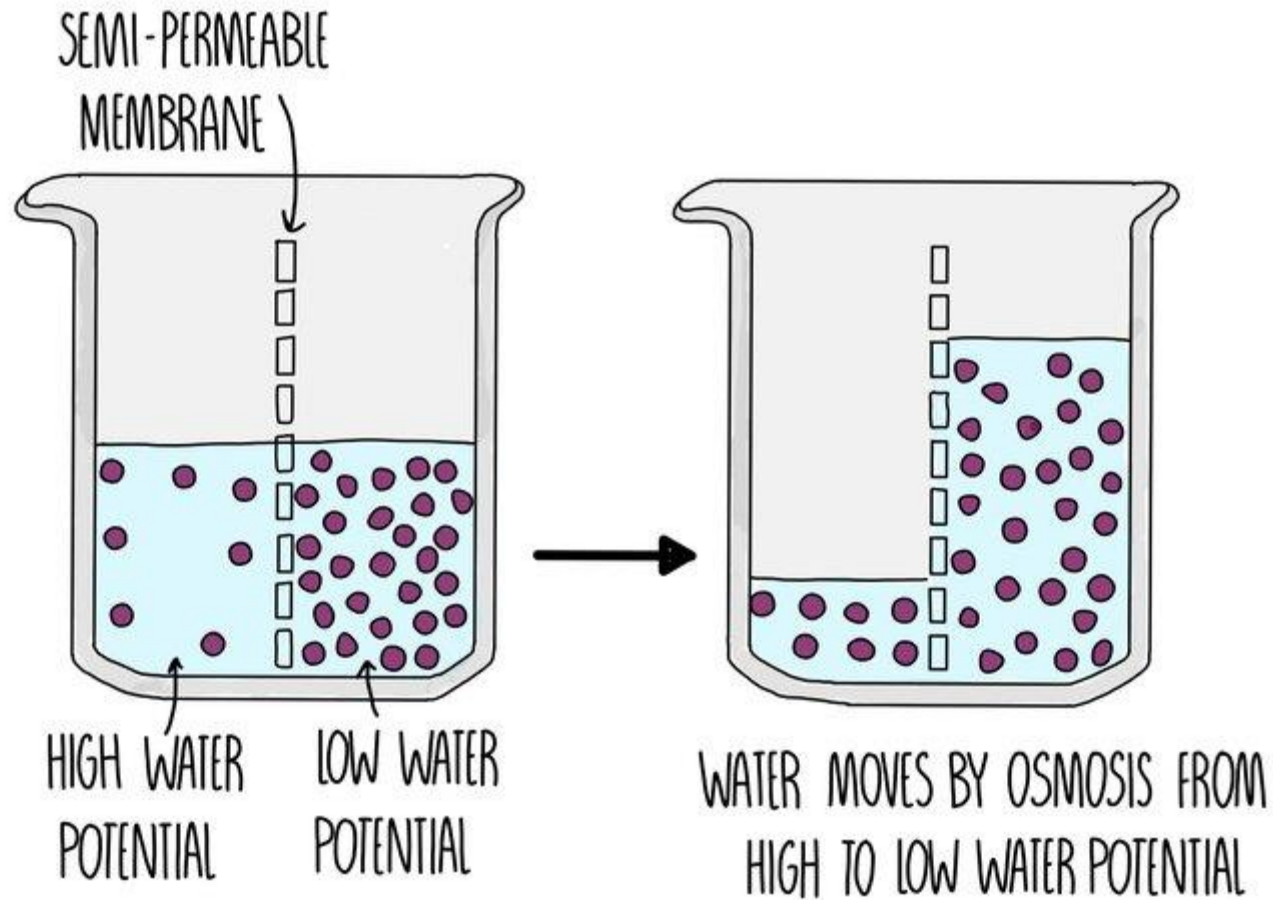
Lipids: Membrane Transport



Lipids: Membrane Transport

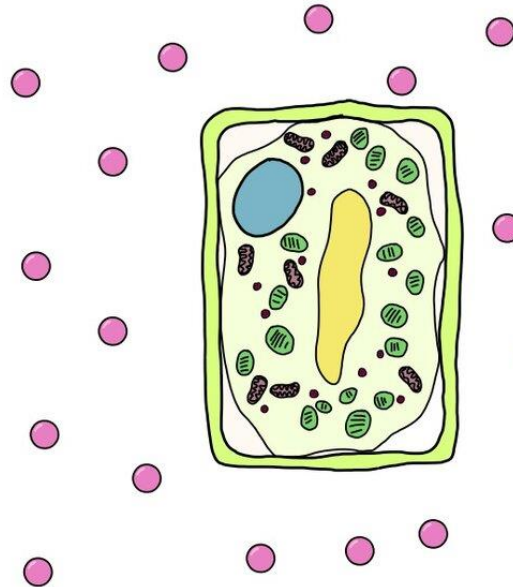


Lipids: Membrane Transport



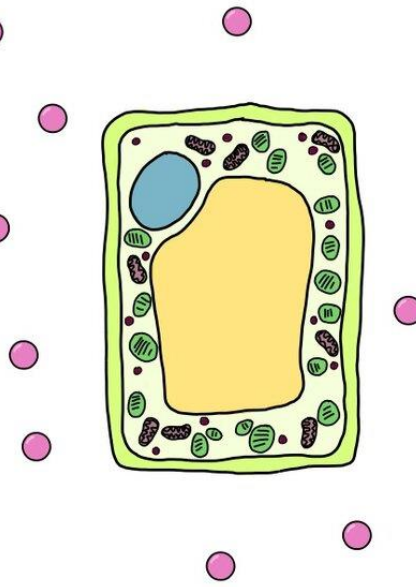
Lipids: Membrane Transport

CONCENTRATED SOLUTION (HYPERTONIC)

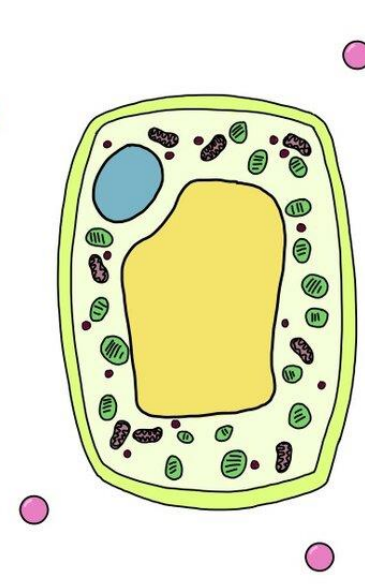


WATER LEAVES CELL BY OSMOSIS
CELL BECOMES PLASMOLYSED

ISOTONIC



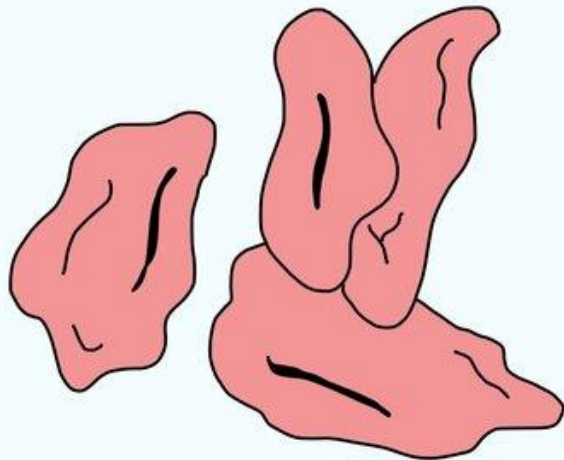
DILUTE SOLUTION (HYPOTONIC)



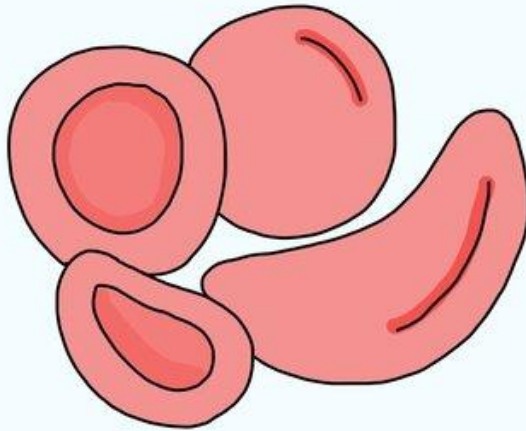
WATER ENTERS CELL BY OSMOSIS
CELL BECOMES TURGID

Lipids: Membrane Transport

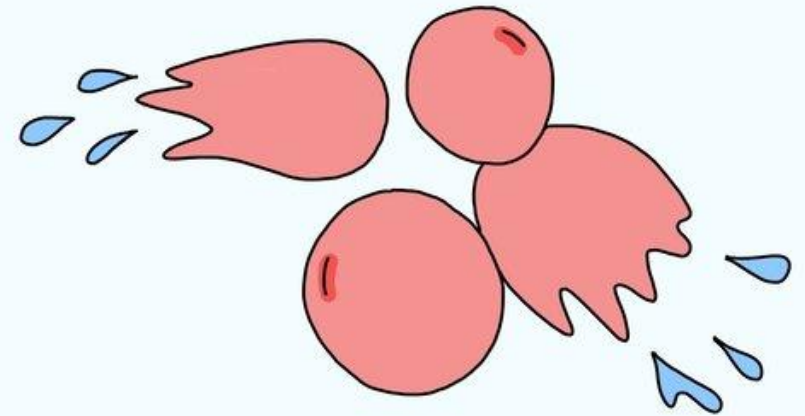
CONCENTRATED SOLUTION (HYPERTONIC)



ISOTONIC



DILUTE SOLUTION (HYPOTONIC)





Carbohydrate

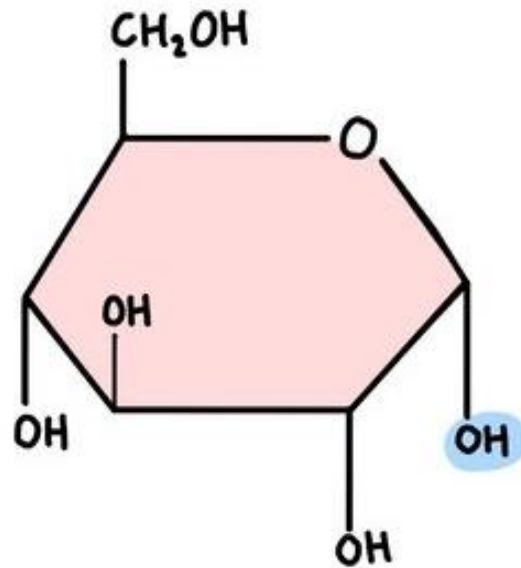
Big Ideas:

- Structure?
- Cellular Respiration?
- Photosynthesis?

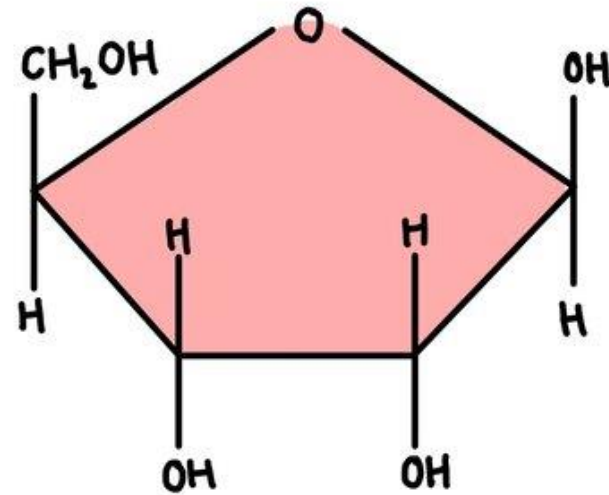


Carbohydrate

α-GLUCOSE



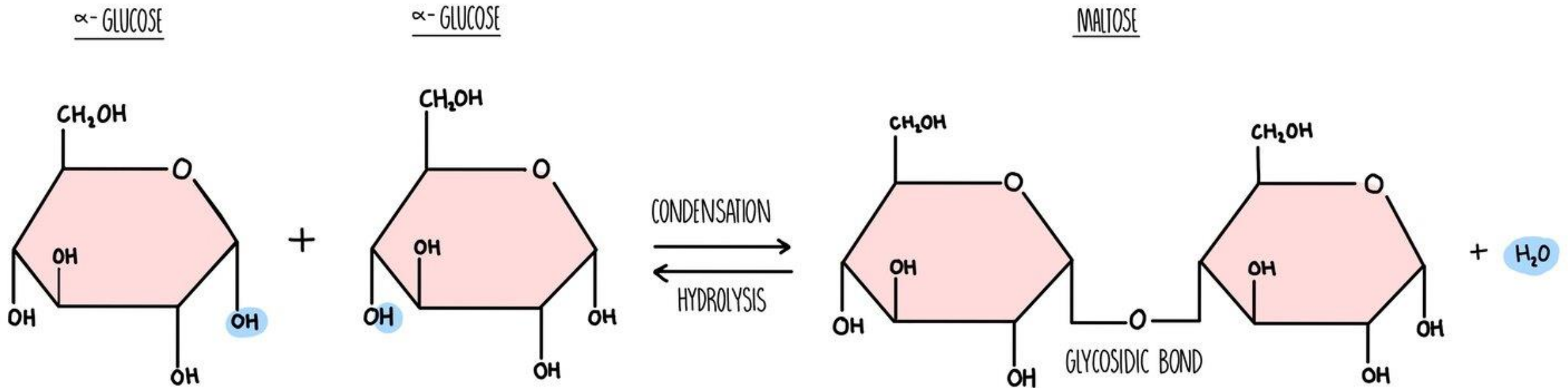
RIBOSE



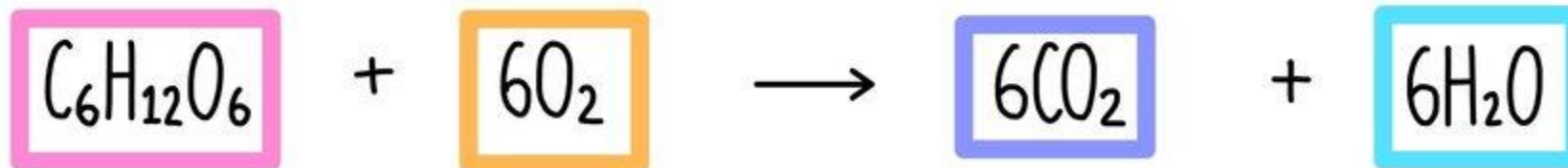
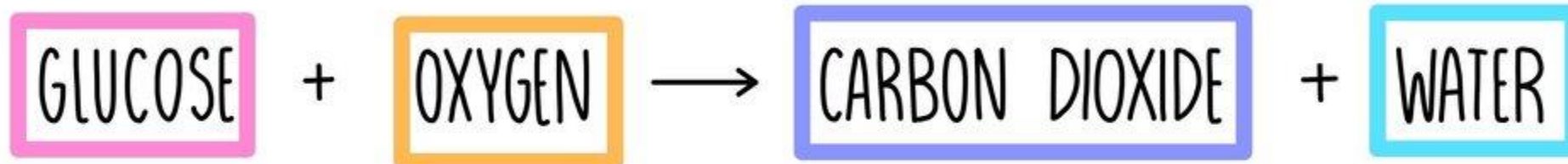
PENTOSE SUGAR



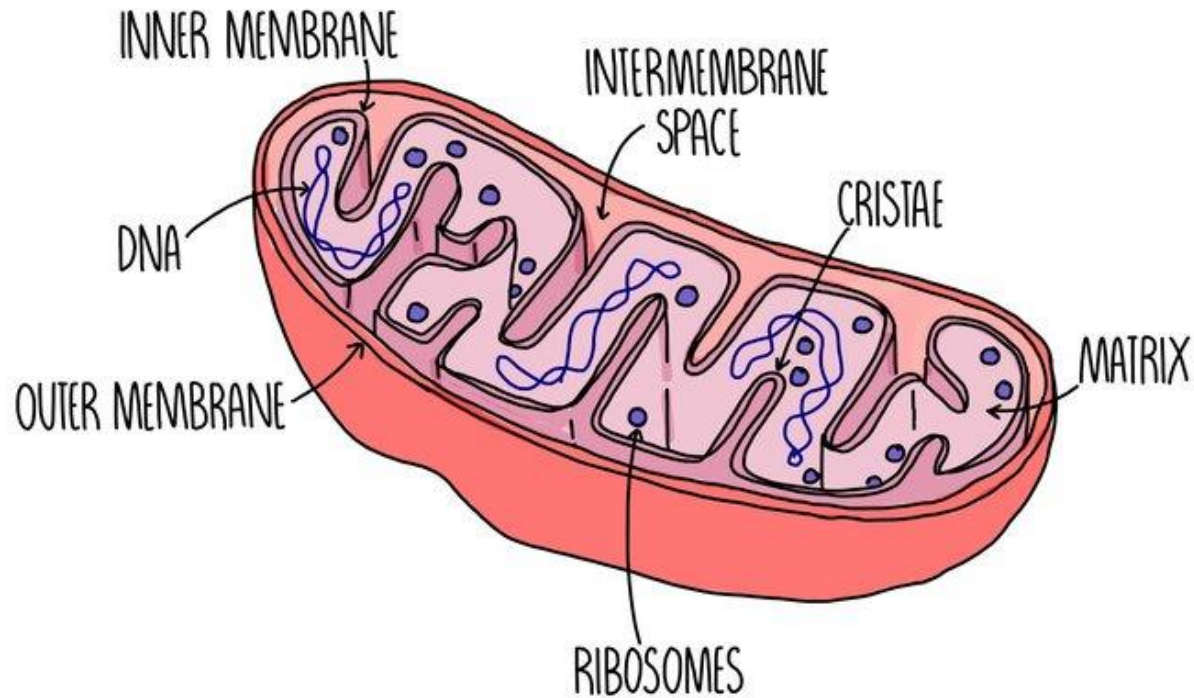
Carbohydrate



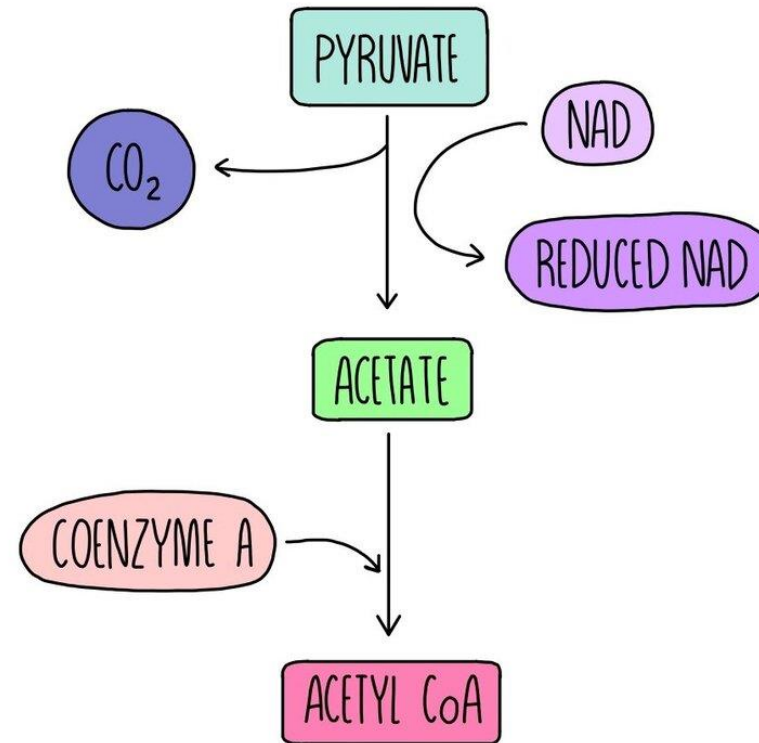
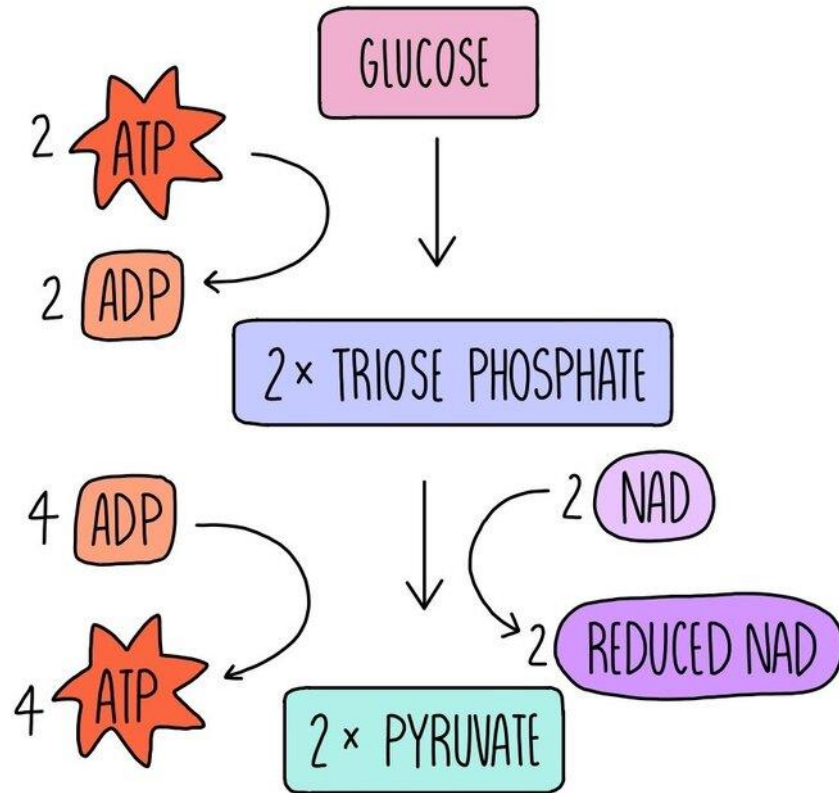
Carbohydrate: Cellular Resp



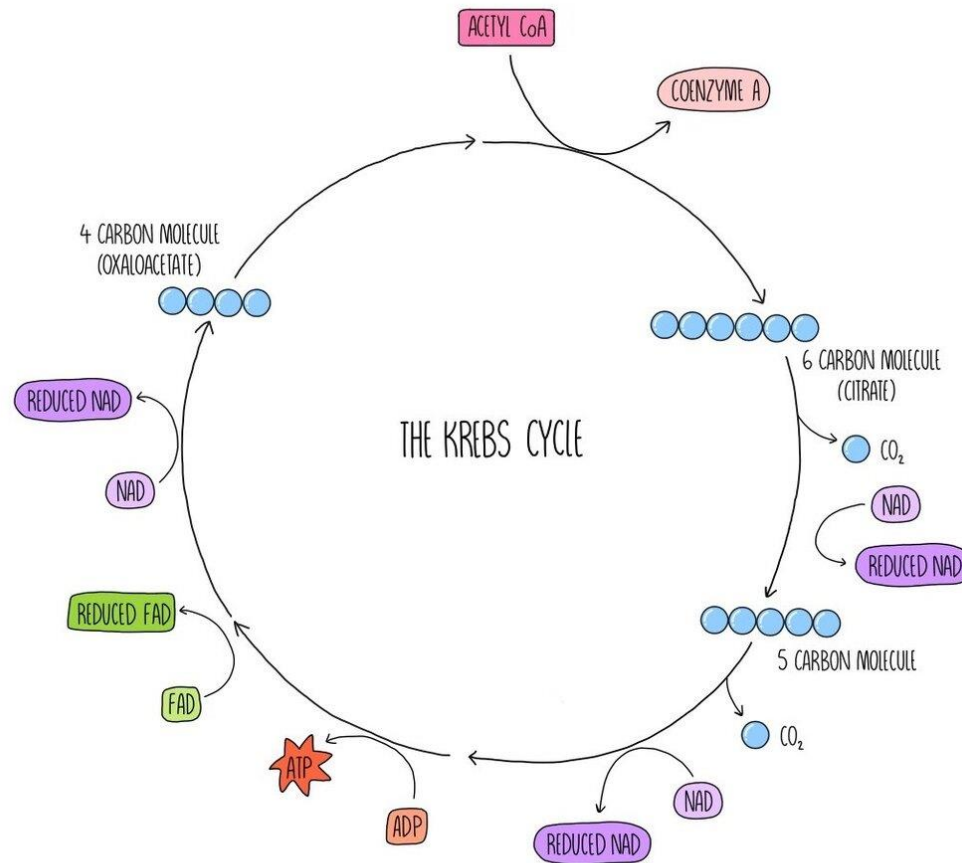
Carbohydrate: Cellular Resp



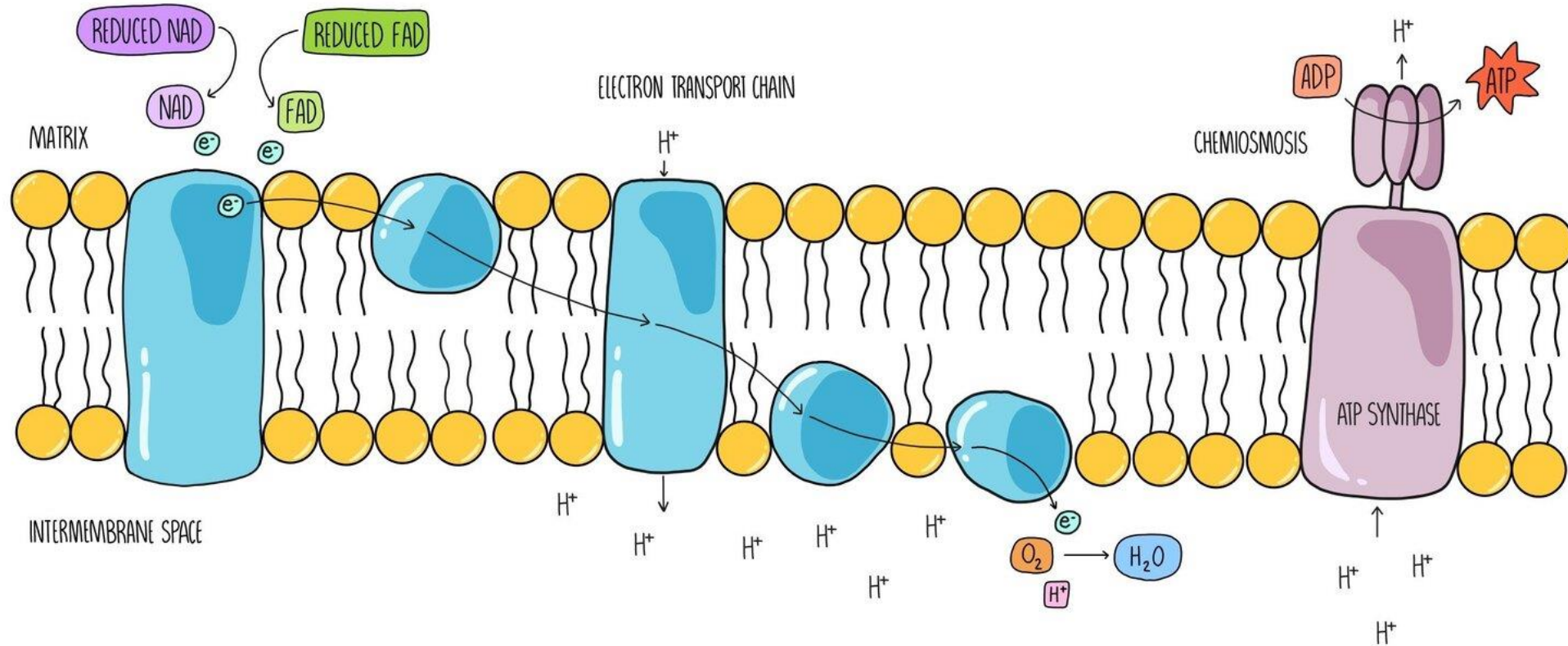
Carbohydrate: Cellular Resp



Carbohydrate: Cellular Resp

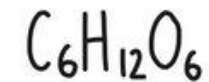
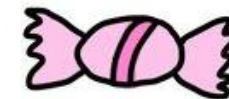
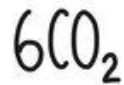
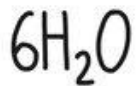


Carbohydrate: Cellular Resp

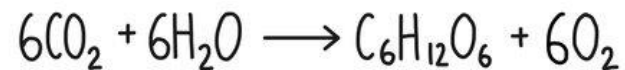


Carbohydrate: Photosynthesis

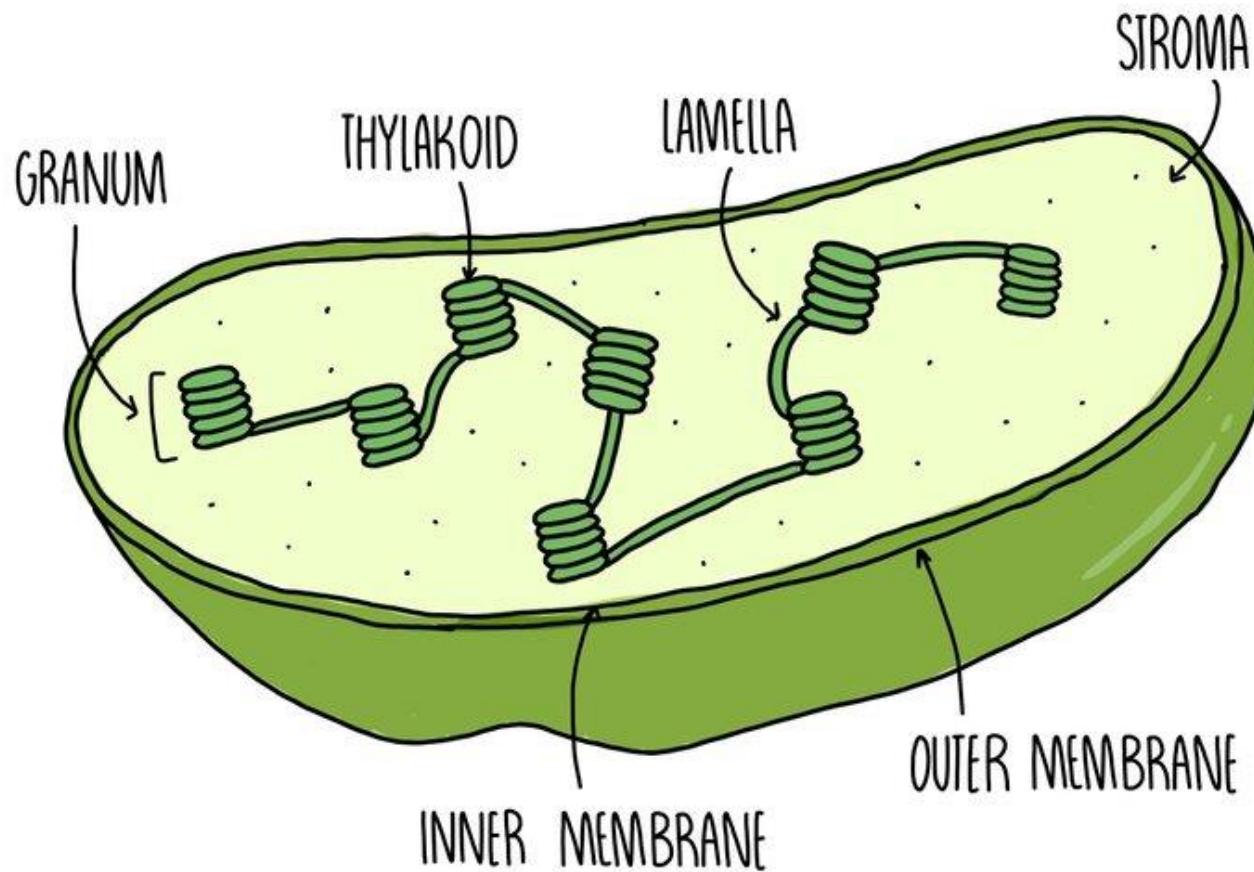
WATER + CARBON DIOXIDE (+ LIGHT) → → GLUCOSE + OXYGEN



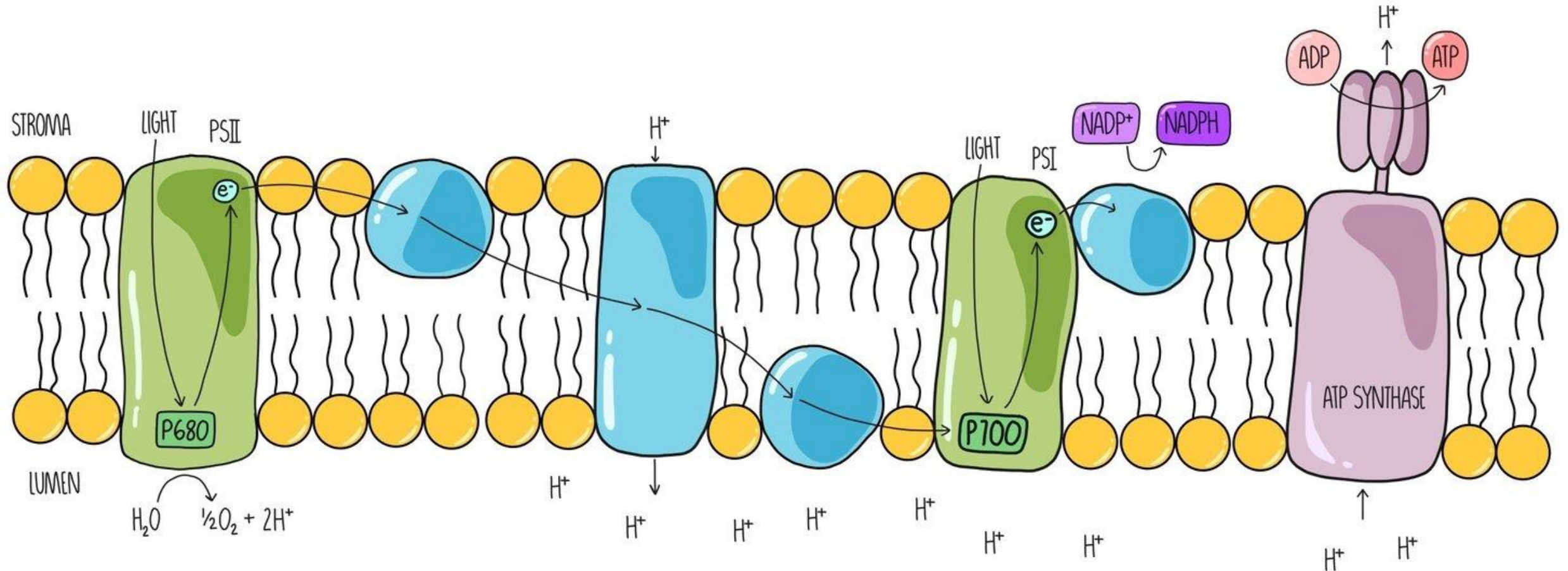
CARBON DIOXIDE + WATER → GLUCOSE + OXYGEN



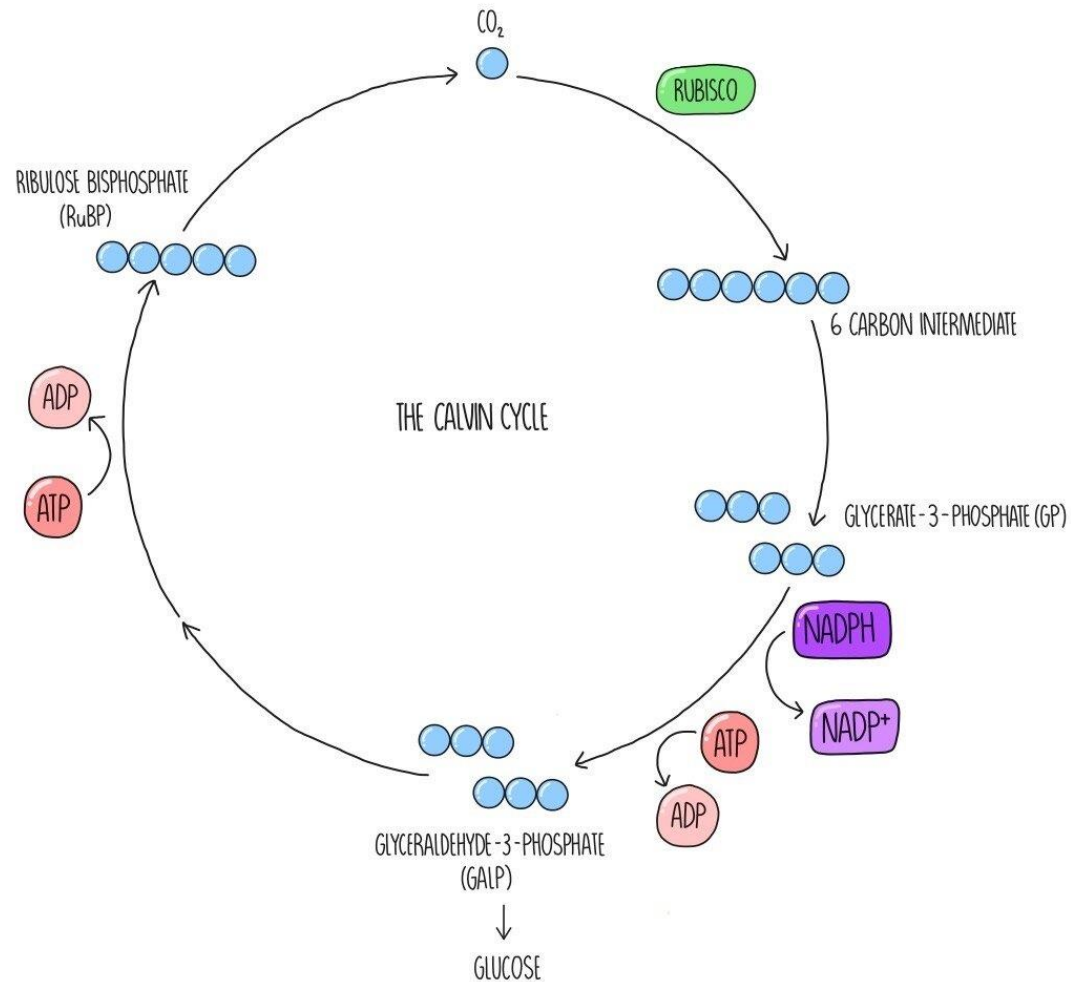
Carbohydrate: Photosynthesis



Carbohydrate: Photosynthesis



Carbohydrate: Photosynthesis





Marco: Do you realize you talk a lot AP Bio Penguin?

Penguin: Just part of my nature to squawk





Strategies for Questions

- Use the diagrams
- Develop your OWN ideas
- Read the questions before reading the prompt
- Underline/circle important information in prompt
- Write/Annotate analysis on graph
- Average about 1.3 minutes per question



Strategies for Questions

FRQ Timing

- Approximate: 25 min per long & 10 min per short
- Paper Recommendation: 20 min per long & 8 min per short
- Checkboxes
- Time on Page
- Paper Exam: Order of Knowledge/Ability



Strategies for Questions

FRQ Writing

- Read the question, Read the question, Read the ...
- Label your responses (a), (b), (c) & (d)
- Write in knowledge order
- Beware of contradictions
- Use the diagrams
- Define your terms
- Cross out
- Pen, Pencil, Crayon, Marker – doesn't matter



See you 5/1 at
2:00pm EST

