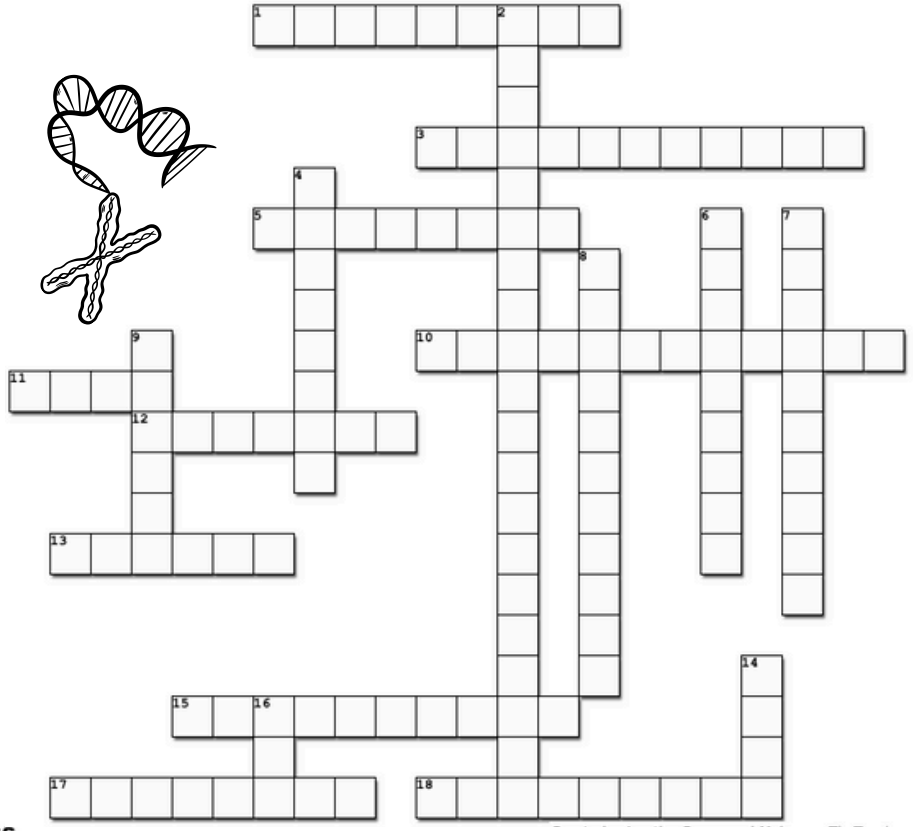


Across

1. Lowercase letters are used to represent this allele; trait only shows when dominant is not present.
3. Punnet squares help calculate _____, which is the likelihood something will happen.
5. It is represented by letters (ex: Aa). Genetic makeup.
10. Having two different alleles for a trait (ex: Aa).
11. Female = XX, _____ = XY.
12. Where DNA is found in eukaryotic cells.
13. Different versions of a gene.
15. Both alleles are fully expressed (ex: Red + white parents = red and white spotted offspring).
17. Uppercase letters are used to represent it; trait always shown when present.
18. The physical appearance resulting from the genotype (ex: brown eyes).

Word bank

Probability, Mendel, Incomplete Dominance, Karyotype, Dominant, Gene, Codominant, Homozygous, Chromosomes, Male, Nucleus, Genotype, Recessive, Phenotype, Allele, Heterozygous, DNA, Pedigree

Down

2. A type of inheritance where neither allele is fully dominant (ex: Red + white parents = pink offspring).
4. A diagram showing the inheritance of a trait through generations.
6. An image of all of an organism's chromosomes.
7. Having two identical alleles for a trait (ex: AA or aa).
8. Humans have 23 pairs of these.
9. Father of genetics Gregor _____.
14. A segment of DNA that codes for a specific trait.
16. Nucleic Acid molecule that carries genetic information.

Biology Review Passport

Part 1

Name:_____

A LEARNING *Journey!*

Macromolecules

fill out the boxes below for the 4 macromolecules of life

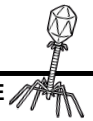
monomer: **polymer:** **Function:** **Example:**	**monomer:** **polymer:** **Function:** **Example:**
monomer: **polymer:** **Function:** **Example:**	**monomer:** **polymer:** **Function:** **Example:**

- **the _____ of proteins determine their function**
- **enzymes_____ activation energy**
- **3 factors that effect enzyme activity:**

Characteristics of life

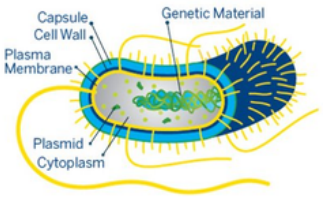
The 7 Characteristics of Life:

1. **Made of _____**
2. **H_____**
3. **M_____**
4. **G_____**
5. **R_____**
6. **Respond to _____**
7. **E_____**

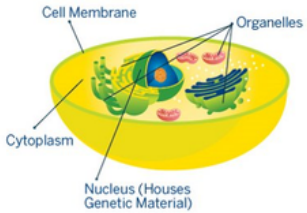


TRUE or FALSE	
Viruses are made of Cells	T / F
Viruses have genetic material	T / F
Viruses can create their own energy	T / F
Viruses can evolve	T / F
Viruses have proteins	T / F
Viruses can reproduce on their own	T / F
Viruses are considered alive	T / F

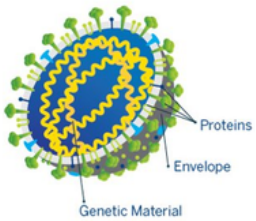
PROKARYOTE



EUKARYOTE



VIRUS



Genetics

If Brown eyes are dominant to blue. **Color** the eyes below according to their alleles.

Phenotype:	Phenotype:	Phenotype:
		
Genotype: **BB**	Genotype: **Bb**	Genotype: **bb**

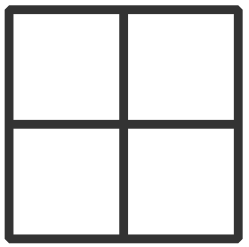
Label which genotypes are: Heterozygous, or homozygous

Law of segregation: individual has two alleles for each gene one from each parent

1. Using the law of segregation explain why it would be impossible for a person with BB to have offspring with blue eyes even if the other parent had blue eyes.

2. Cross 2 heterozygous brown eye parents to predict probability of offsprings eye color

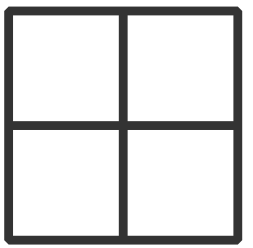
% chance brown eyed: **% chance blue eyed:**

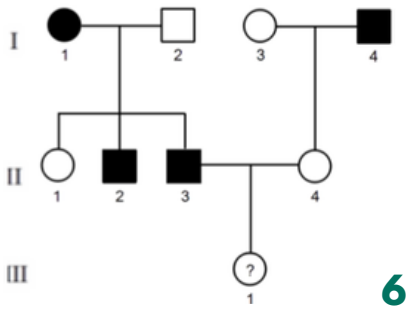


3. If BB X bb made offspring with green eyes this inheritance pattern is called?
a. incomplete dominance
b. codominant

4. If BB X bb made offspring whose eyes were speckled with blue dots and brown dots this inheritance pattern is called?
a. incomplete dominance
b. codominant

5. If color blindness is a recessive trait and a carrier female (X^BX^b) mates with a normal vision male what are the possible genotypes & phenotypes of their offspring? looking at the pedigree what are the chances the individual marked ? is color blind?





DNA+Protein Synthesis

DNA BASE PAIRING
A- C-
RNA BASE PAIRING
A- C-

- Shape of DNA: _____
- DNA is copied _____ conservatively
- Number of nucleotide bases in DNA____

Draw and label each step include: DNA, Nucleus, rRNA, TRNA, amino acid, mRNA, codon

DNA Replication	Transcription	Translation

Mini Graph

Build and label a graph for this data

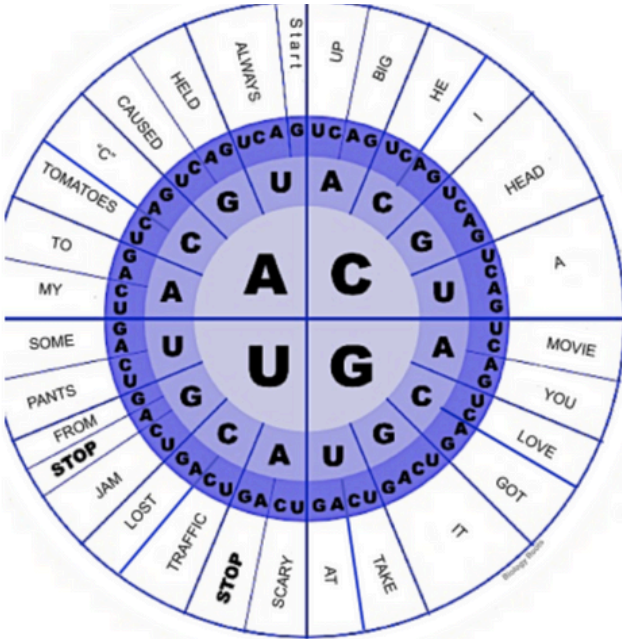
Temp C: 35 55 65 75
enzyme: 30 35 16 10
activity

Use the codon chart to decode the joke:

What did the mommy tomato say to her baby?

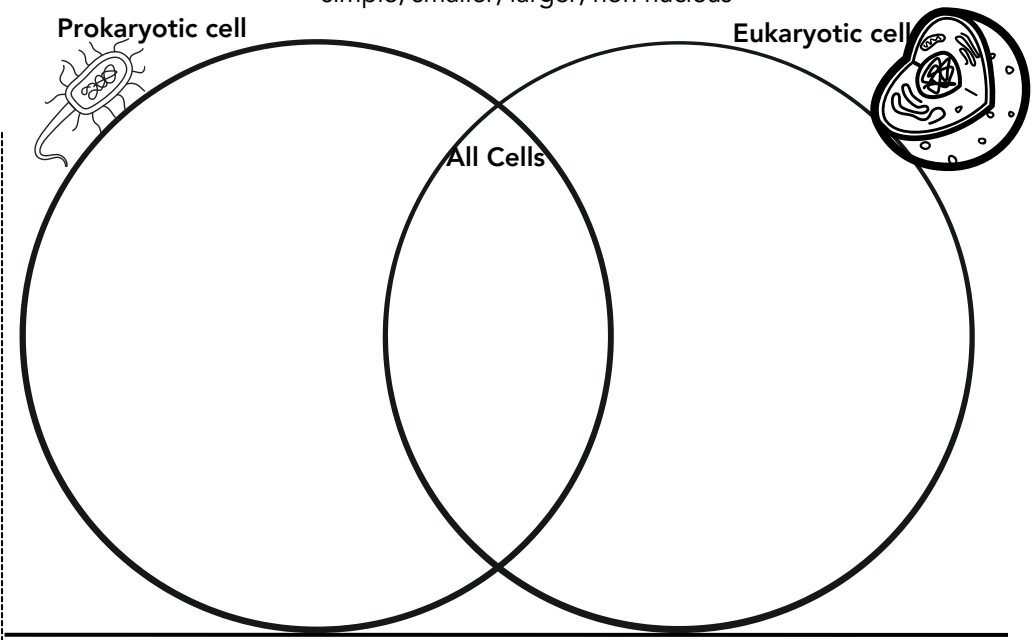
DNA: GGT CGG CTC ACC TTA GCT TGA

mRNA:



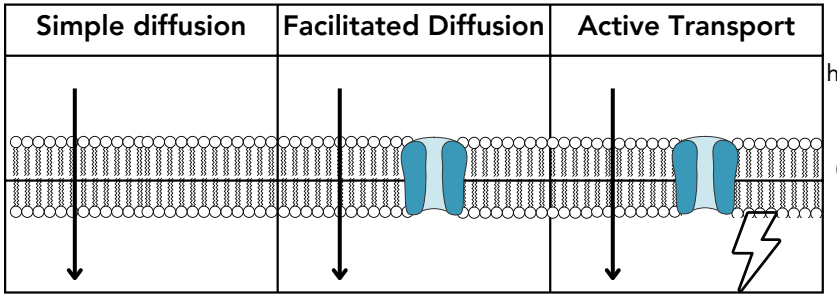
Cell Types

Mitochondria, ribosome, nucleus, cytoplasm, cell, membrane, DNA, cell wall, animal cells, plant cells, fungal cells, bacterial cells, single celled, multicellular, complex, simple, smaller, larger, non nucleus

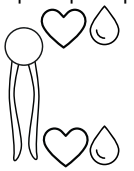


Cell Transport

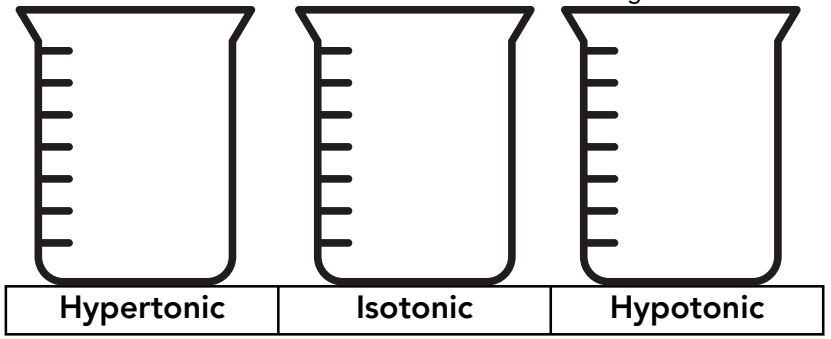
Below: Draw the solutes showing the correct concentration for each transport type, label ATP



X out the <3 next to the hydrophobic part of the phospholipid



Below: Draw cells reactions to each solution and arrows showing the movement of water



Cell Cycle Mitosis

I

P

M

A

T

C

Phase	Drawing	Description
		longest phase, G1: growth, S: DNA copied, G2 growth prep, check point
		
Metaphase		
		cytoplasm divides, creating two distinct cells

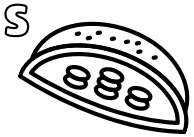
Mitosis produces how many daughter cells?

Are the daughter cells Identical?

What are the phases of interphase and in what phase is DNA copied in?

Cell Energy

Photosynthesis



Organelle:

Cell Types:

Equation

_____ +_____+_____ → _____ +_____

Reactants **Products**

Cellular respiration

Organelle:

Cell Types:

Equation

_____ +_____ → _____ +_____+_____

Reactants **Products**

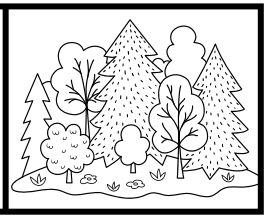
Aerobic: Respiration with oxygen makes 38 ATP

_____Respiration with NO oxygen makes ___ ATP

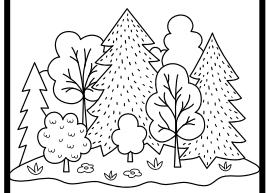
Ecological succession:

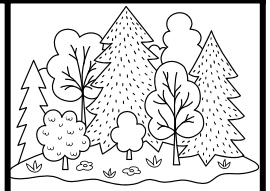
draw a comic in the boxes depicting each ecological succession type

Primary Succession



Secondary Succession



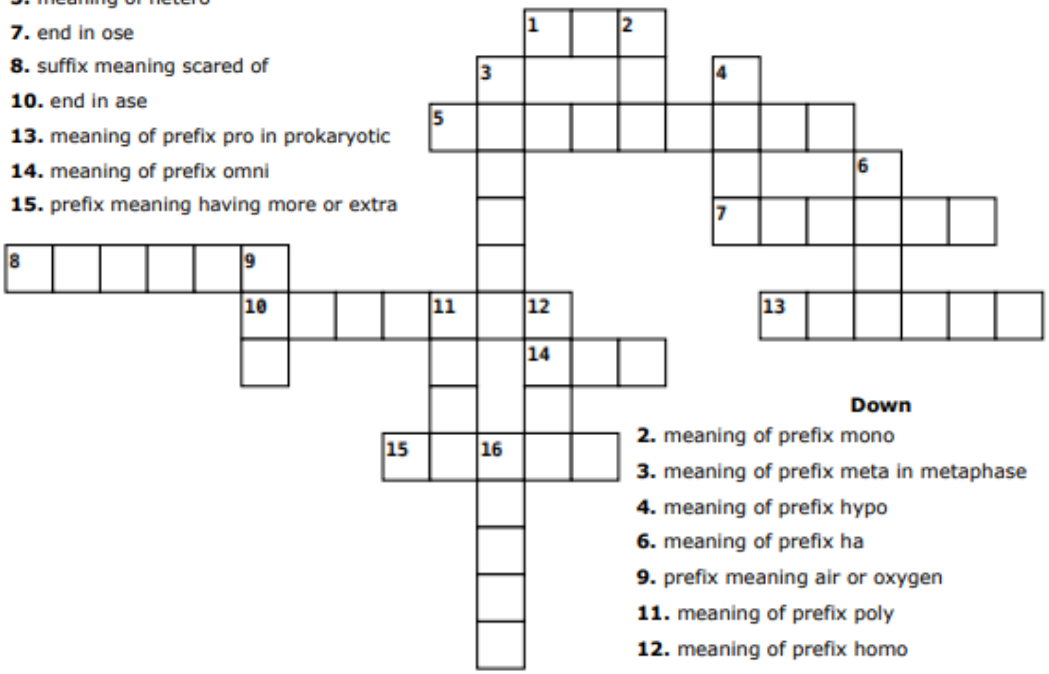


What is the final stage of all successions?

_____

Across

1. meaning of prefix di/bi
5. meaning of hetero
7. end in ose
8. suffix meaning scared of
10. end in ase
13. meaning of prefix pro in prokaryotic
14. meaning of prefix omni
15. prefix meaning having more or extra



Down

2. meaning of prefix mono
3. meaning of prefix meta in metaphase
4. meaning of prefix hypo
6. meaning of prefix ha
9. prefix meaning air or oxygen
11. meaning of prefix poly
12. meaning of prefix homo
16. prefix meaning light or color

Biology Review Passport

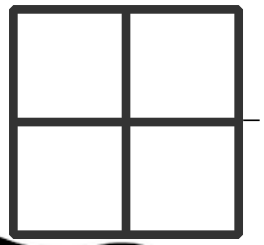
Part 2

Name:_____

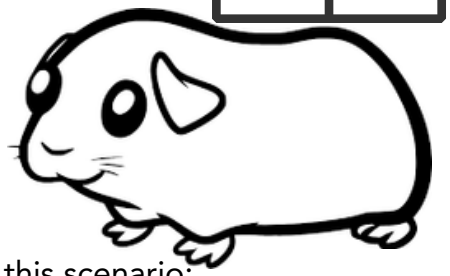
A LEARNING Journey!

Complex Genetics

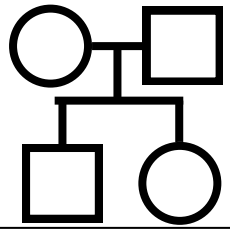
1. If a flowers alleles for color are incompletely dominant using the Punnett square predict the possibilities of the offspring color when a red (RR) and white (WW) flower mate.
color in the square the offspring would be



2. Guinea pigs' coat color is made of codominant alleles, orange and black. Color the Guinea pig to show its coat if its alleles are OB

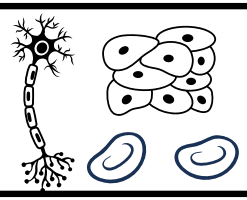
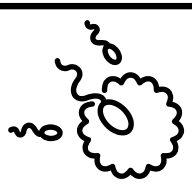


3. Color in the pedigree to represent this scenario: A female is affected by colorblindness she is (X^bX^b) and she mates with a male who has normal vision (X^BY). They have a son and a daughter.



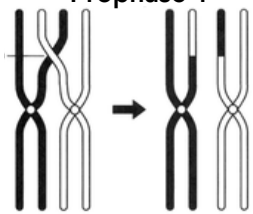
Meiosis

1.fill out the table below

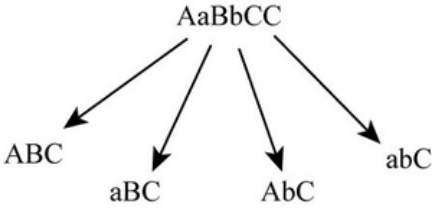
	
Somatic/Body Cells	_____Cells
# chromosomes 46 ____ ploid	# chromosomes ____ ____ ploid
Mitosis = 2 Identical daughter cells	Meiosis = __ _____ daughter cells

2. label the two factors of meiosis pictured below that contribute to genetic variation

Prophase 1



_____



_____

Nitrogen Cycle

Read then label diagram-

Most of the nitrogen on Earth is in the **atmosphere as atmospheric nitrogen (N_2)**, but plants and animals cannot use it in that form. It must be changed into other forms through the **nitrogen cycle.**

The first step is **nitrogen fixation. Nitrogen-fixing bacteria in the roots** of legume plants (like beans) convert atmospheric nitrogen into usable nitrogen compounds. These compounds become part of the soil.

When plants and animals die, **decomposers** break down their bodies. This releases nitrogen back into the soil in the form of **ammonium (NH_4^+)**.

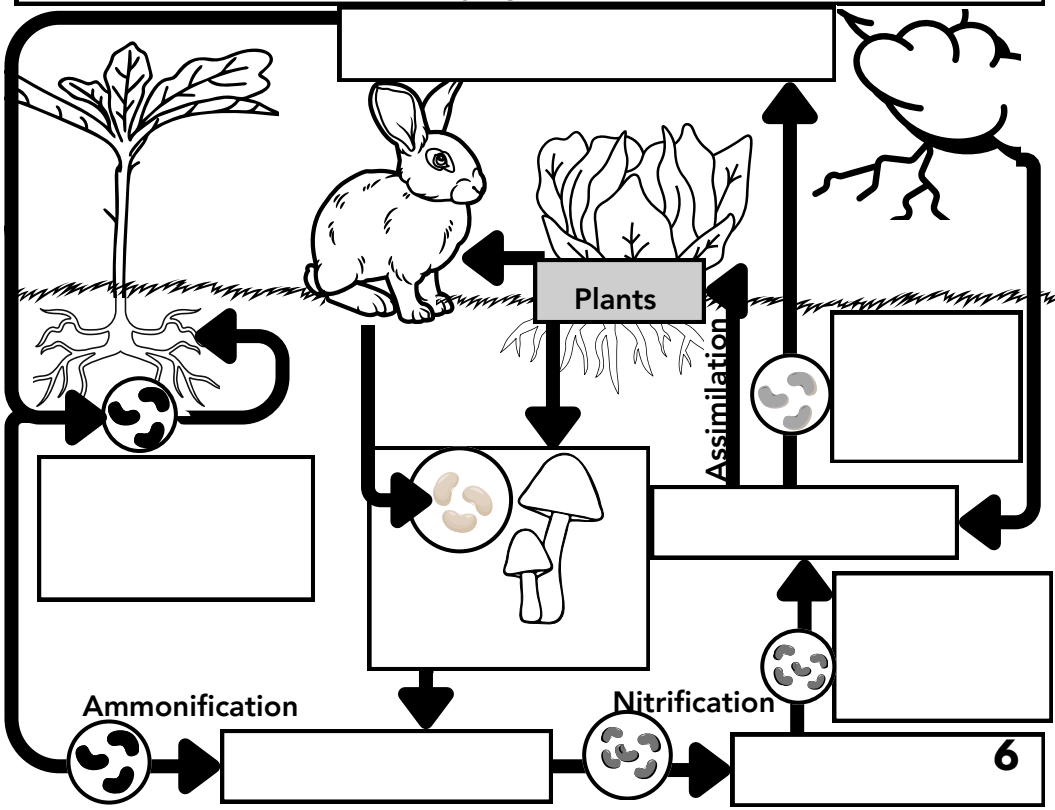
Nitrifying bacteria in the soil perform **nitrification**. The bacteria first convert ammonium into **nitrites (NO_2^-)**, and then into **nitrates (NO_3^-)**. Nitrates are absorbed through plant roots.

Denitrifying bacteria perform **denitrification**, converting nitrates back into nitrogen gas, returning it to the atmosphere, completing the cycle.

Lightning can also fix a small amount of atmospheric nitrogen, turning it into usable forms that enter the soil through rainfall.

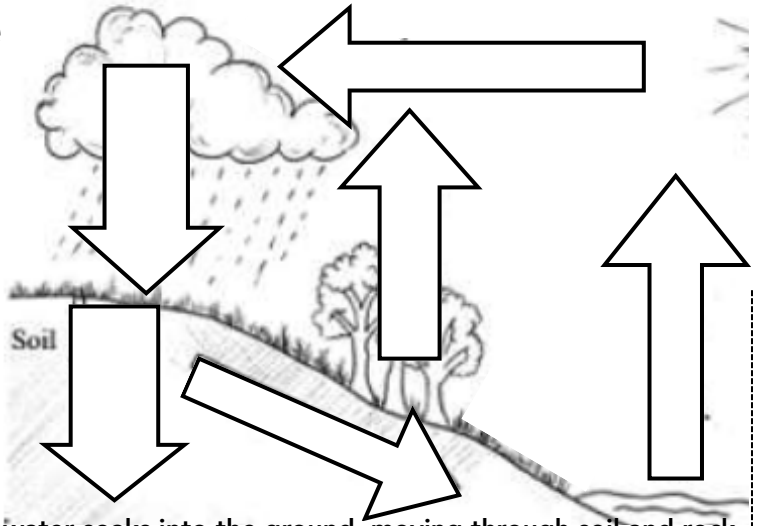
Word Bank:

Atmospheric Nitrogen (N_2) **Decomposers** **Nitrifying Bacteria**
Ammonium (NH_4+) **Nitrogen Fixing Bacteria in roots**
Nitrites (NO2-) **Denitrifying Bacteria** **Nitrates (NO3-)**



Water Cycle

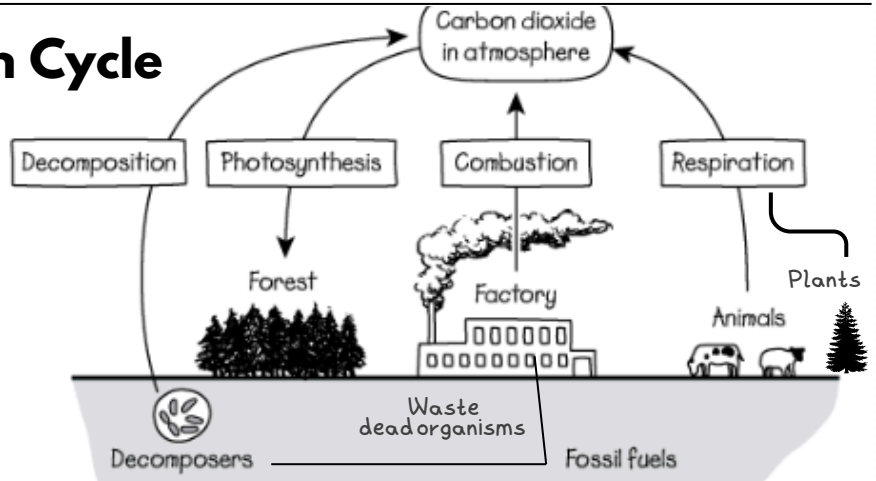
Word Bank:
Infiltration
condensation
run off
evaporation
transpiration
precipitation



_____= rainwater soaks into the ground, moving through soil and rock

_____= release of water vapor from leaves/plants into the atmosphere

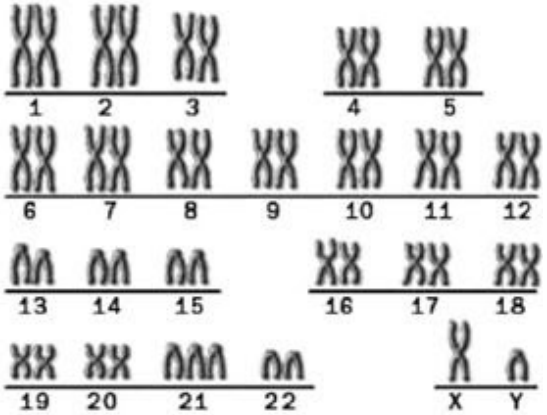
Carbon Cycle



system	C in atmosphere (+, and or -) += increases = decreses	reason/process
Plants		
Animals		
Humans		
Waste + Dead Organisms	+	Burning fossil Fuels

5

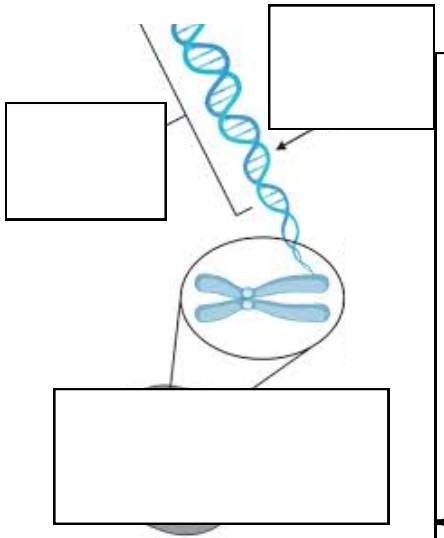
Mutations



Is this person a boy or a girl?

Circle the **chromosomal mutation** on the Pic of chromosomes also called a _____

mutation does not change the amino acid made___ **S**= Silent
mutation introduces a stop codon___ **N**= Nonsense
mutation changes one amino acid made___ **M**= Missense



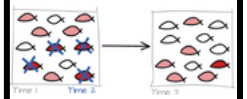
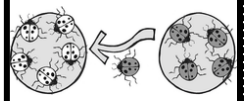
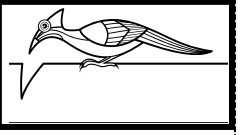
_____Shift

Normal DNA	TAT	CAT	CCT	AAG	GTA
Protein	Tyr	His	Pro	Lys	Val
Substitution	TAT	CAT	CGT	AAG	GTA
Protein	Tyr	His	Arg	Lys	Val
Insertion	TAT	CAT	CGC	TAA	GGT A
Protein	Tyr	His	Arg	Stop	Gly
Deletion	TAT	C_TC	CTA	AGG	TA
Protein	Tyr	Leu	Leu	Arg	...

2

Evolution

List and define 5 Mechanisms of Evolution:

T/F fittest means the strongest

T/F Individuals evolve not populations

T/F fittest means reproduces the most

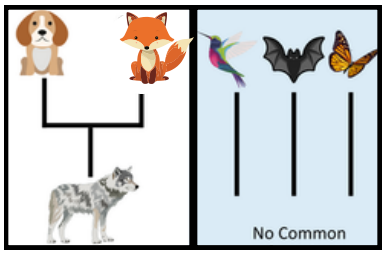
Number in correct order 1-4:

__Variation exists in a population

__Individuals w helpful traits survive & reproduce

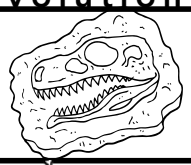
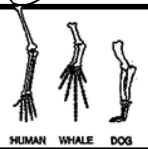
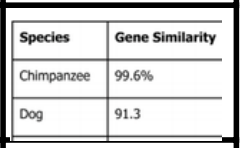
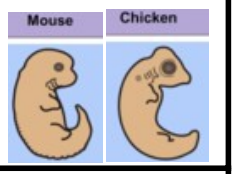
__Over time, the population changes

__Competition leads to struggle for survival



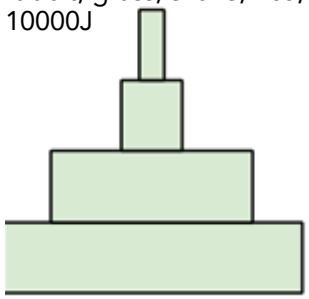
put a **C** next to the convergent evolution and a **D** next to the divergent evolution group

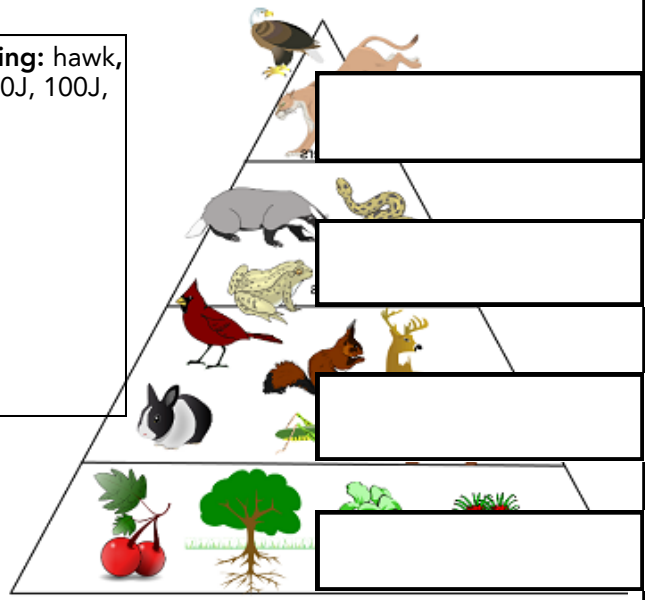
Evidence of Evolution

	
	
	
	
	
	antibiotic resistance 

Ecology

Label the pyramid below using: hawk, rabbit, grass, snake, 10J, 1000J, 100J, 10000J





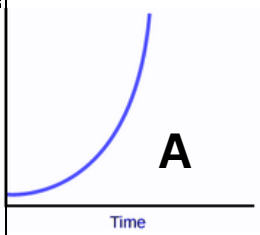
Label all the levels of the pyramid starting with producer

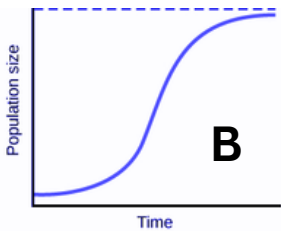
What % of energy moves up the trophic levels?_____

If there is 10,000 KJ of primary producer, how much will be available for the apex predator? _____

Match the terms:

____Producer	A. Non-living things in an environment (air, sunlight, water)
____Consumer	B. Organism that gets energy by breaking down dead matter
____Decomposer	C. Organism that eats other organisms
____Omnivore	D. A community of organisms and their environment
____Ecosystem	E. Diet consist of both plant and animal material
____Biotic Factor	F. Living part of an ecosystem (plants, animals)
____Abiotic Factor	G. Organism that makes its own food using sunlight
____Carrying Capacity	H. The maximum population size an environment can support





Which graph shows a population at carrying capacity?

Name 4 factors that can affect carrying capacity -

ANSWER KEY

Macromolecules

fill out the boxes below for the 4 macromolecules of life

Carbohydrates
monomer: Monosaccharides
polymer: polysaccharides
Function: store energy
Example: glucose, starch

Proteins
monomer: amino acids
polymer: polypeptide
Function: catalyze , hormones, structure transpor
Example: enzymes, insulin

Lipids
monomer: glycerol, fatty acid
polymer: phospholipids
Function: long energy insulation
Example: fats, oils

Nucleic Acids
monomer: nucleotides
polymer: DNA RNA
Function: store genetic information
Example:

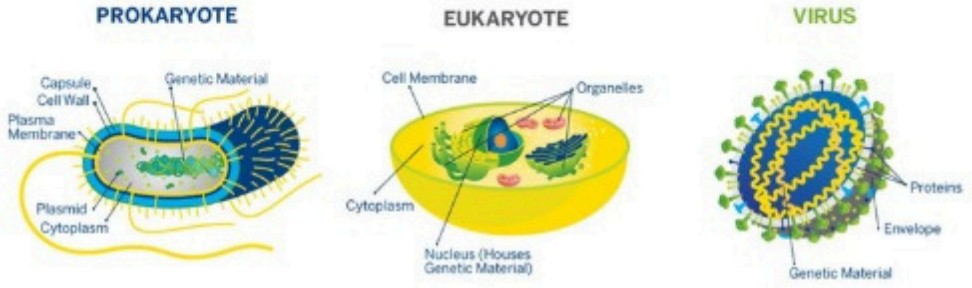
- the shape/structure of proteins determine their function
- enzymes lower activation energy
- 3 factors that effect enzyme activity: pH, Temp, Concentration

Characteristics of life

The 7 Characteristics of Life:

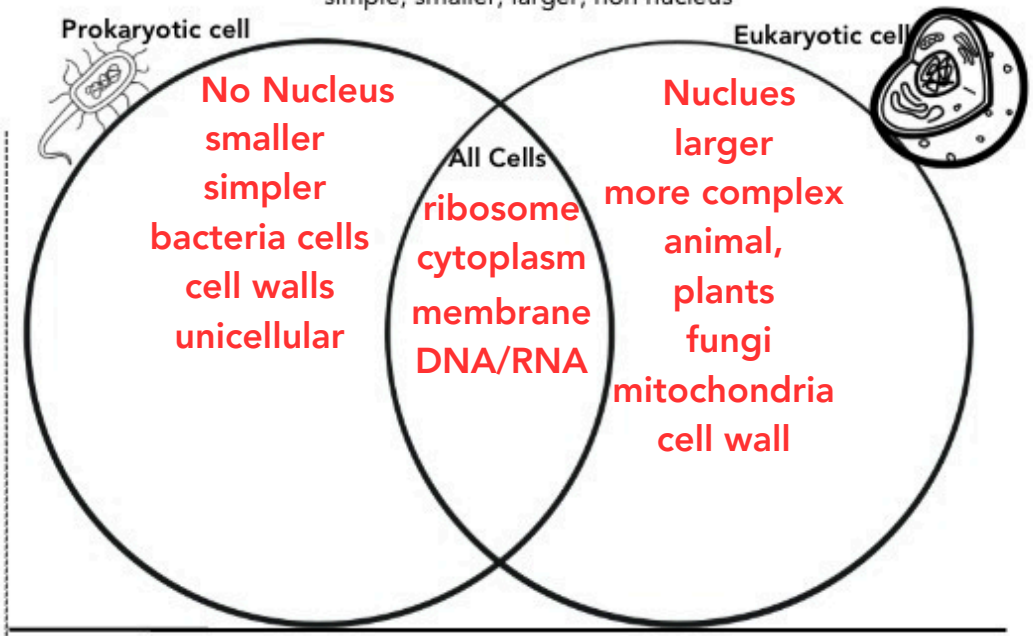
1. Made of cells
2. H omeostasis
3. M etabolism
4. G row
5. R eproduce
6. Respond to stimuli
7. E volve

TRUE or FALSE	
Viruses are made of Cells	T F
Viruses have genetic material	T F
Viruses can create their own energy	T F
Viruses can evolve	T F
Viruses have proteins	T F
Viruses can reproduce on their own	T F
Viruses are considered alive	T F



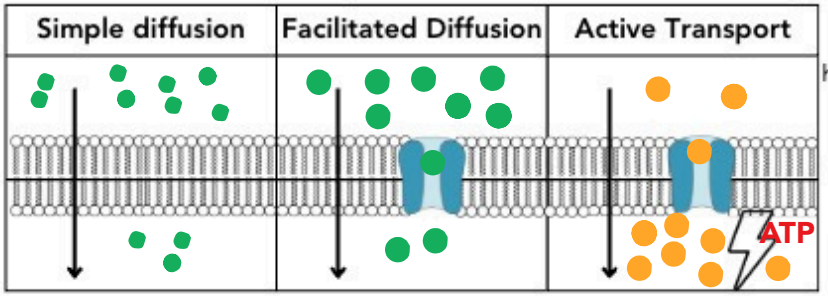
Cell Types

Mitochondria, ribosome, nucleus, cytoplasm, cell, membrane, DNA, cell wall, animal cells, plant cells, fungal cells, bacterial cells, single celled, multicellular, complex, simple, smaller, larger, non nucleus



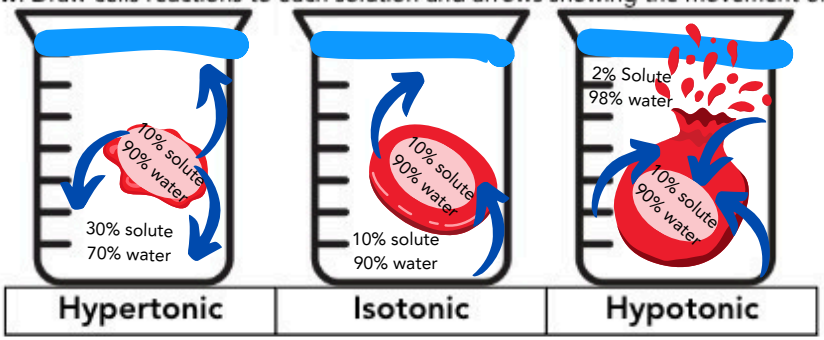
Cell Transport

Below: Draw the solutes showing the correct concentration for each transport type, label ATP

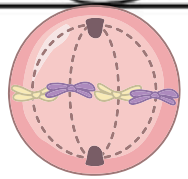
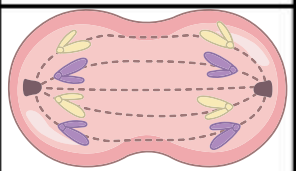
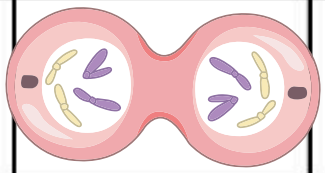
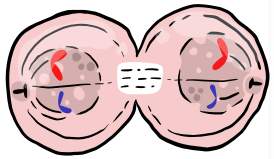


X out the <3 next to the hydrophobic part of the phospholipid

Below: Draw cells reactions to each solution and arrows showing the movement of water



Cell Cycle Mitosis

	Phase	Drawing	Description
I	interphase		longest phase, G1: growth, S: DNA copied, G2 growth prep, check point
P	prophase		nuclear envelope breaks down
M	Metaphase		chromosomes align in the middle
A	anaphase		chromosomes pull away
T	Telophase		Nuclei reforms
C	Cytokinesis		cytoplasm divides, creating two distinct cells

Mitosis produces how many daughter cells?

2

Are the daughter cells Identical?

yes, 2 identical daughter cells

What are the phases of interphase and in what phase is DNA copied in? G1, S and G2. DNA is copied in the S phase

Cell Energy

Photosynthesis

Organelle: Chloroplasts

Cell Types: Plant

Equation

$6CO_2$ + $6H_2O$ + Energy from Sun → $C_6H_{12}O_6$ + $6O_2$

Reactants

Carbon Dioxide

Water

Products

Glucose

oxygen

Cellular respiration

Organelle: Mitochondria!

Cell Types: Plants and Animal

Equation

$C_6H_{12}O_6$ + $6O_2$ → $6CO_2$ + $6H_2O$ + ATP

Reactants

Glucose

oxygen

Products

Carbon Dioxide

Water

ATP!

2

Aerobic: Respiration with oxygen makes 38 ATP

Anaerobic Respiration with NO oxygen makes ___ ATP

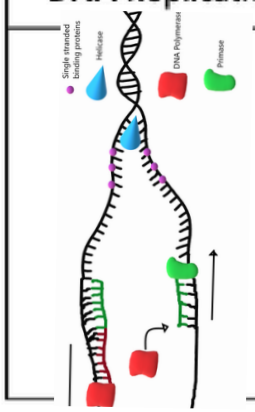
DNA+Protein Synthesis

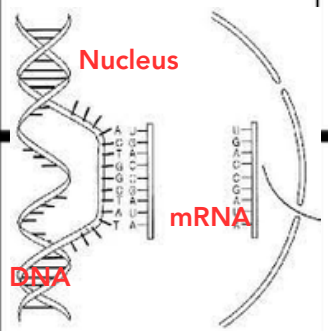
DNA BASE PAIRING	
A- T	C- G
RNA BASE PAIRING	
A- U	C- G

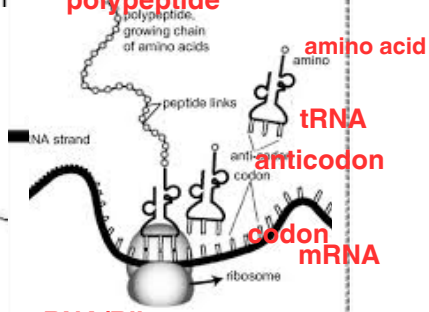
- Shape of DNA: Double helix
- DNA is copied semi conservatively
- Number of nucleotide bases in DNA 4

Draw and label each step include: DNA, Nucleus, rRNA, TRNA, amino acid, mRNA, codon

DNA Replication	Transcription	Translation



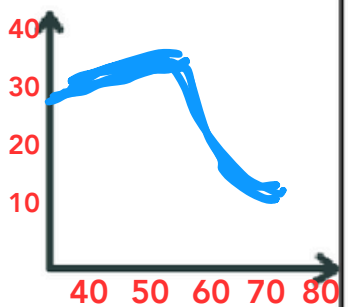




Mini Graph

Build and label a graph for this data

Temp C: 35 55 65 75
enzyme: 30 35 16 10
activity

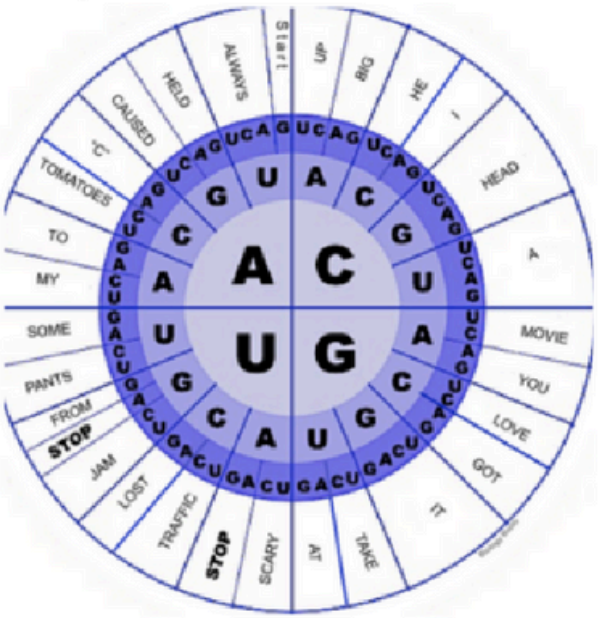


Use the codon chart to decode the joke:

What did the mommy tomato say to her baby?

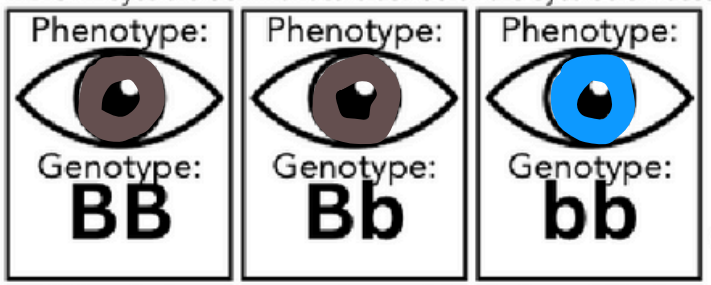
DNA: GGT CGG CTC ACC TTA GCT TGA

mRNA:



Genetics

If Brown eyes are dominant to blue. **Color** the eyes below according to their alleles.



Label which genotypes are: Heterozygous, or homozygous

Law of segregation: individual has two alleles for each gene one from each parent

1. Using the law of segregation explain why it would be impossible for a person with BB to have offspring with blue eyes even if the other parent had blue eyes.

each parent passes on only 1 of their 2 alleles for a trait to their offspring. If a person is BB, they can only pass on dominant B alleles. even if the other parent is blue eyed and passes on a b allele, the offspring will always receive at least one B from the BB parent. This means the child's will be Bb, and they will show the dominant trait (brown eyes)

2. Cross 2 heterozygous brown eye parents to predict probability of offsprings eye color

% chance brown eyed: 75% 3:1 % chance blue eyed: 25% 3:1

	B	b
B	BB	Bb
b	Bb	bb

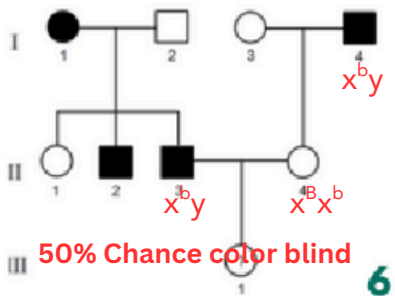
3. If BB X bb made offspring with green eyes this inheritance pattern is called?
a. incomplete dominance
b. codominant

4. If BB X bb made offspring whose eyes were speckled with blue dots and brown dots this inheritance pattern is called?
a. incomplete dominance
b. codominant

5. If color blindness is a recessive trait and a carrier female (X^BX^b) mates with a normal vision male what are the possible genotypes & phenotypes of their offspring? looking at the pedigree what are the chances the individual marked ? is color blind?

	X^B	X^b
X^B	X^BX^B	X^BX^b
Y	X^BY	X^bY

	X^B	X^b
X^b	X^BX^b	X^bX^b
y		



50% Chance color blind

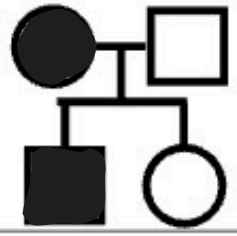
Complex Genetics

1. If a flowers alleles for color are incompletely dominant using the Punnett square predict the possibilities of the offspring color when a red (RR) and white (WW) flower mate. color in the square the offspring would be

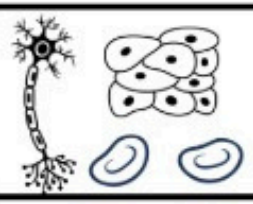
	R	R
W	RW	RW
W	RW	RW

2. Guinea pigs' coat color is made of codominant alleles, orange and black. Color the Guinea pig to show its coat if its alleles are OB

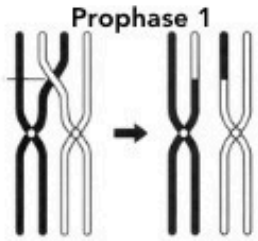
3. Color in the pedigree to represent this scenario: A female is affected by colorblindness she is (X^bX^b) and she mates with a male who has normal vision (X^BY). They have a son and a daughter.



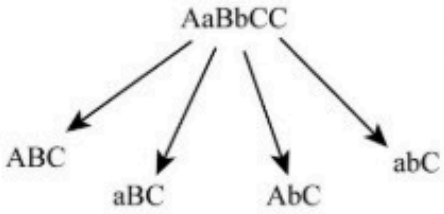
Meiosis 1.fill out the table below

	
Somatic/Body Cells	Sex/Gamete Cells
# chromosomes 46 di ploid	# chromosomes 23 ha ploid
Mitosis = 2 Identical daughter cells	Meiosis = 4 Varying/different daughter cells

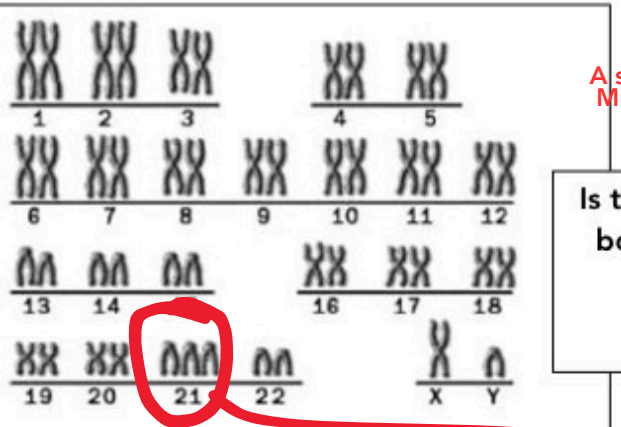
2. label the two factors of meiosis pictured below that contribute to genetic variation



Crossing over



Independent Assortment



Mutations

A source of Genetic Variation! Mutations are usually neutral but can sometimes be harmful or helpful!

Is this person a boy or a girl?

XY=Boy

you should only have two of each chromosomes more or less causes mutations/disease.

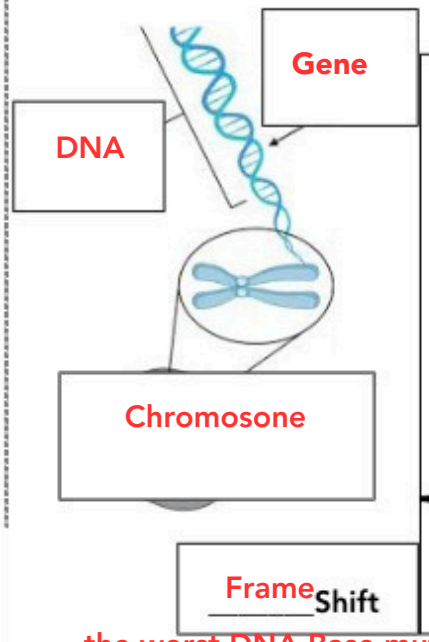
Circle the **chromosomal mutation** on the Pic of chromosomes also called a Karyotype

mutation does not change the amino acid made S

mutation introduces a stop codon N

mutation changes one amino acid made M

S= Silent
N= Nonsense
M= Missense



Normal DNA	TAT	CAT	CCT	AAG	GTA
Protein	Tyr	His	Pro	Lys	Val
Substitution	TAT	CAT	CGT	AAG	GTA
Protein	Tyr	His	Arg	Lys	Val
Insertion	TAT	CAT	CGC	TAA	GGT A
Protein	Tyr	His	Arg	Stop	Gly
Deletion	TAT	C_TC	CTA	AGG	TA
Protein	Tyr	Leu	Leu	Arg	...

Frame Shift

the worst DNA Base mutation, causes allot of change!