

Key

1. The Plant Thing

- Remember: angi likes flowers and gym likes cones

	vascular tissue	cones	seeds	flowers
plant A	X	X	X	
plant B				
plant C	X		X	X
plant D	X			

gymnosperm (tracheophyte)
 moss (bryophyte)
 angiosperm (tracheophyte)
 fern (tracheophyte)

Identify the type of plant.

2. DNA Doozies

- make sure to SLOW DOWN & READ CAREFULLY
- common error: you know the difference between replicate and transcribe, you just read too fast

Where does transcription occur in a eukaryotic cell?

nucleus

Replicate the following strand of DNA.

GTC CAG GTC
CAG-GTC-CAG

Where does replication occur in a eukaryotic cell?

nucleus

Transcribe the following strand of DNA.

GTC CAG GTC
CAG-GUC-CAG

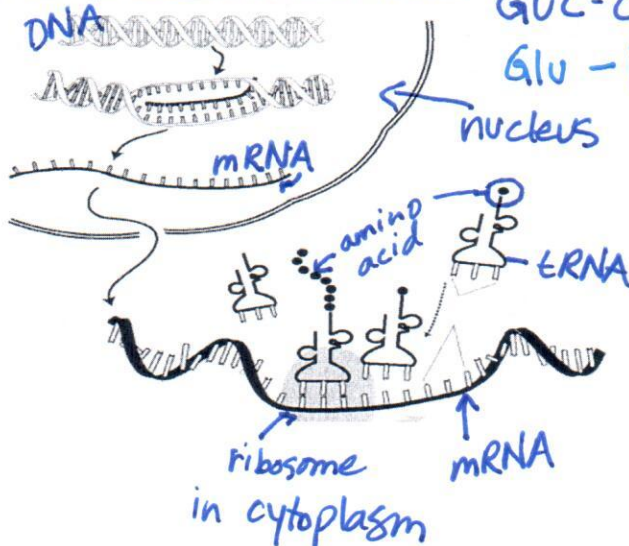
Where does translation occur in a eukaryotic cell?

in cytoplasm at ribosome

Translate the following strand of DNA into tRNA & the associated amino acid.

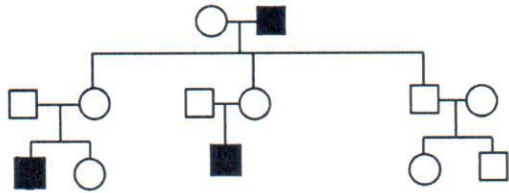
GTC-CAG-GTC - DNA
CAG-GUC-CAG- mRNA
GUC-CAG-GUC - tRNA
Glu - Val - Glu - amino acid

Label the process or molecule.



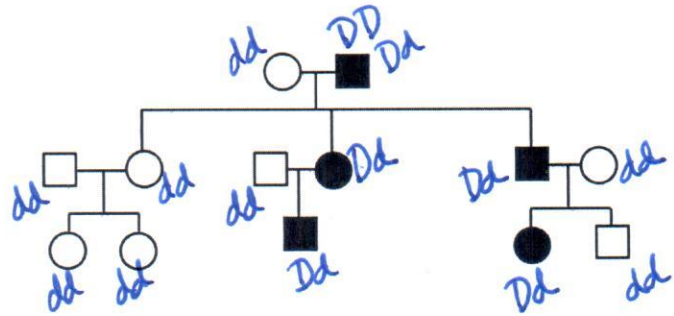
3. Pedigree Problems

- sex-linked traits – males are affected every other generation
- autosomal dominant traits – males and females of every generation are affected & have 50% chance of giving trait to offspring
- autosomal recessive – affected individuals have to have two recessive alleles; sickle cell
- based on the pedigree type, work backwards to figure out the genotypes of each person based on the given phenotype and inheritability factor

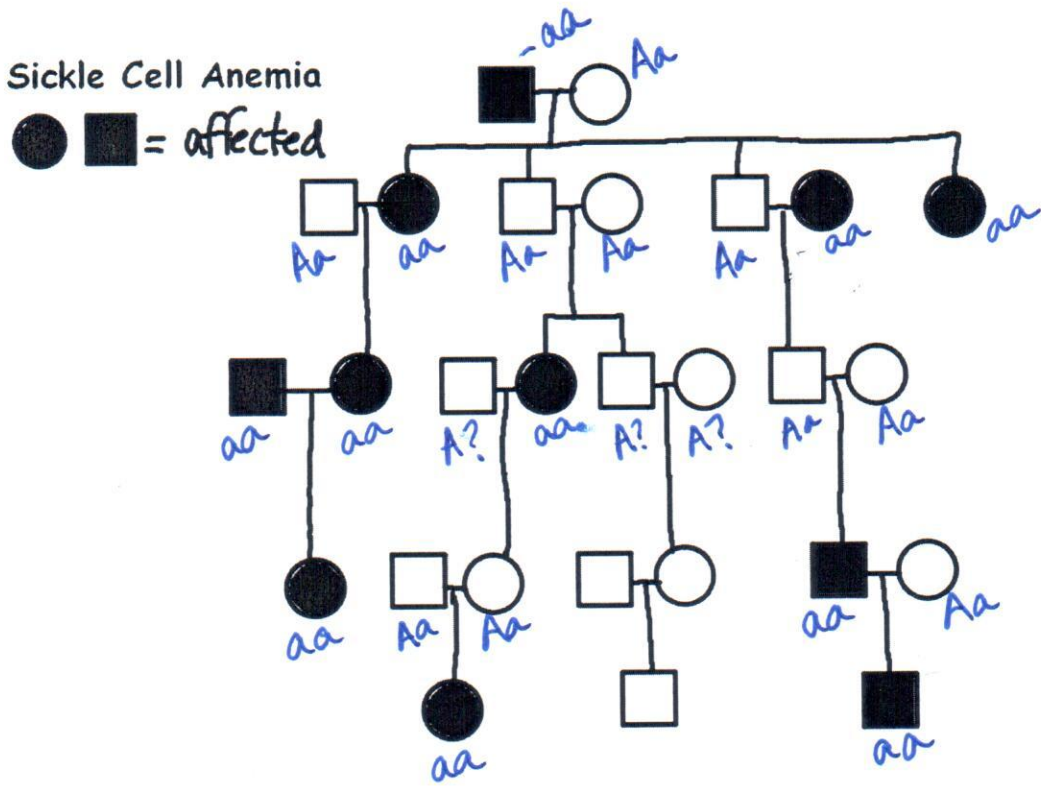


This could represent the inheritance pattern of
 autosomal dominant
 autosomal recessive
sex-linked

This could represent the inheritance pattern of
 Huntington's Disease
 Cystic Fibrosis
 Sickle Cell Anemia
colorblindness



This trait is
dominant recessive



What is the possible genotype of _____?

4. Nondisjunction Dysfunction

- nondisjunction = meiosis mistake
- a karyotype can only show a nondisjunction NOT a mutation BECAUSE karyotypes show the whole chromosome and not individual genes; therefore you can't see the individual genes to determine if there is a gene mutation!

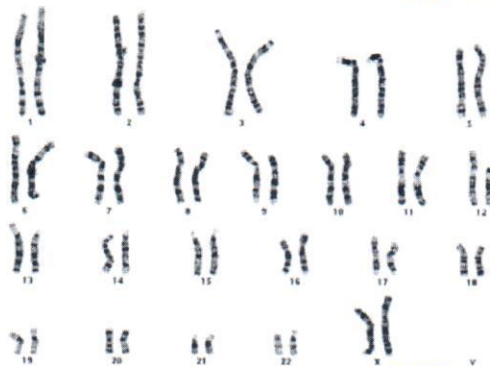
Does this diagram show a mutation or a nondisjunction?



nondisjunction

What is the only type of genetic defect can you see on a karyotype?

What does this image represent?



What type of disorder does this image confirm?

- A) mutation
or
B) nondisjunction

off there's a Y it's a GUY!
XX
XXY

This is a normal female XX

5. Genetic Variation – Concept of a Gazillion Names

- genetic variation = sexual reproduction = meiosis
- cloning = asexual reproduction = mitosis
- you can add "genetic drift" to the following list of terms

adaptation = any trait that aids chance for survival

What are the main sources of genetic variation in organisms?



The following terms are examples of

genetic variation

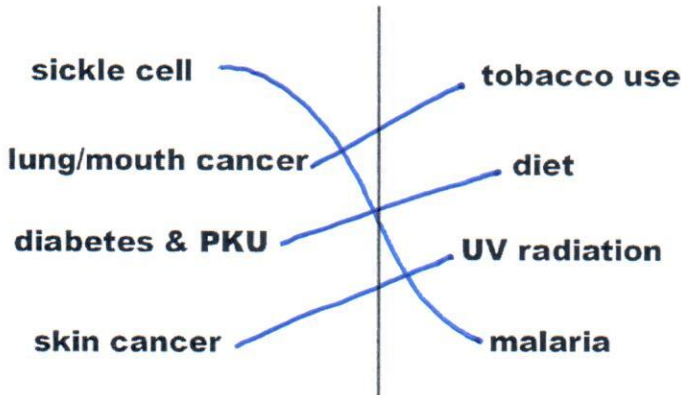
- meiosis
- sexual reproduction
- Crossing over
- gene shuffling
- mutation

genetic drift

6. Mutation Myths – ALL MUTATIONS ARE HARMFUL

- in fact, most mutations are corrected by your RNA
- mutations create genetic diversity and may lead to favorable adaptations that help an organism survive (through natural selection); for example, bacteria can develop a resistance to antibiotics
- mutations are influenced by the environment
- some mutagenic agents can cause cancer (cancer = mitosis gone wild = creates a tumor)

Link the following interactions...



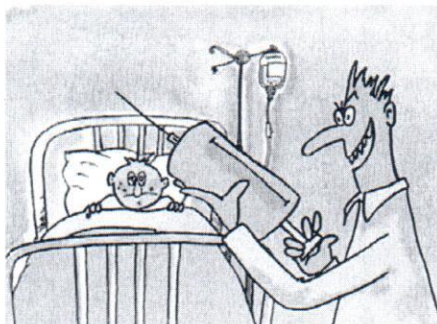
List 2 mutagenic agents that can cause cancer in humans by causing their cells to develop a mutation?

UV radiation
toxins - nicotine,
radon gas,
asbestos

Bacteria can develop resistance to antibiotics.

Insects can develop resistance to pesticides.

antibiotics



pesticides



genes mutate > variations are selected > populations evolve

7. Biotechnology Blitz

- gene therapy can only treat genetic diseases that are on a specific targeted gene
- gene therapy CANNOT treat disorders detected on a karyotype like Down's syndrome or Klinefelter's syndrome BECAUSE those disorders are chromosomal in origin and affect more than just one specific gene
- this is a common error b/c chromosomes contain genes and it gets confusing
- the transgenic organism is the one that gets the gene inserted into its DNA

What is one possible advantage for cloning an organism?

same endangered species

What is the function of a restriction enzyme?



What is a possible advantage of bacterial transformation in the production of insulin?

much needed product/drug for diabetics can be made cheaply + quick

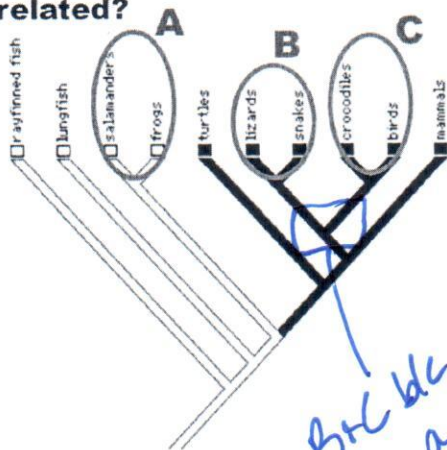
What is the function of gene therapy?

treat genetic disorders caused from a specific gene

8. The Evolution Convolution

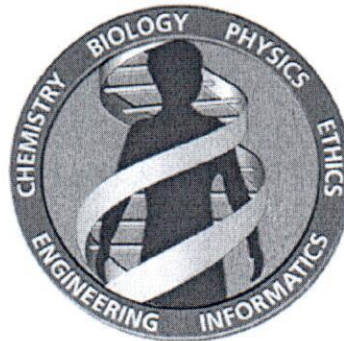
- COMMON ANCESTOR = key word
- the evidence for evolution points towards a common ancestor

Which pairs of organisms are most closely related?



B+C b/c they share a more recent common ancestor

What is the value of the Human Genome Project?

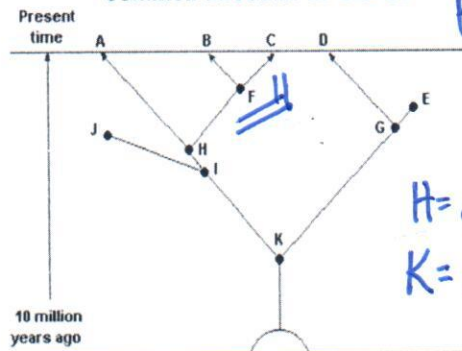


- understand genetic trait transmission
- understand disease
- develop new medicines + treatments

What's the evidence for evolution?

- 1) comparative anatomy
 - homolog. struct.
 - vestigial struct.
- 2) fossil evidence
- 3) biochemical evidence (similar DNA)

Which organism represents the common ancestor of B & C?



H = c.a. of A, B, C, F
K = c.a. of all organisms

Explain how geographic isolation can lead to speciation in an organism.

organisms are separated by a geographic barrier + adapt to their different environments over time until they would no longer mate

9. Cell Hell

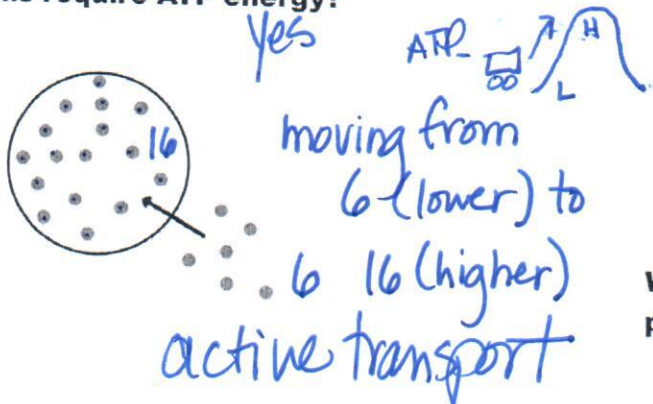
- remember: Pro – No, Eu – Yes; prokaryotes have no nucleus and eukaryotes do have a nucleus
- active transport – low to high concentration; requires energy
- passive transport – high to low concentration; DOES NOT require energy; osmosis and diffusion are examples
- remember: "The quarterback threw an OD PASS DOWN the field" – O = osmosis, D = diffusion, PASS = passive transport, DOWN = goes down from high to low
- when determining if something is active or passive transport – pay attention to the arrows on the diagram and count the number of little shapes – Are the molecules moving from higher to lower or lower to higher?
- mi-TO-sis – a type of cell division that starts with one cell and makes two
- ME-iosis – a type of cell division that explains how I got here – the fusion of ga-ME-tes! (gametes = sperm & egg)

What are the 2 main pathways cells use to communicate with each other?

hormones + nerves (electrical impulses)

What type of cell transport is illustrated?

Does this require ATP energy?



Determine if the cell type is a prokaryote or eukaryote.

animal cell - euk

plant cell - euk

eubacteria cell = prok

protist cell = euk.

archaebacteria cell = prok.

fungal cell = euk.

What cell organelles do prokaryotes & eukaryotes share?

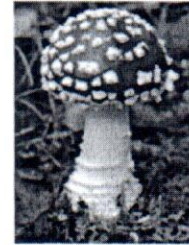
Because there was no oxygen the 1st organisms on earth were...

- eukaryotic or prokaryotic (simple; no nucleus)
- heterotrophic or autotrophic
- aerobic or anaerobic (w/out O₂)

	Meiosis	Mitosis
1. What type of cells?	gametes only	all other cells but gametes
2. Diploid or Haploid daughter cells?	haploid = N	diploid = 2N
3. Identical or different from parent cell?	different	identical
4. Number of cells that result?	4	2

10. Miscellaneous Mess

- familiarity with various types of dominance in Punnett Squares is good (blood types)
- innate behavior – born with it vs. learned behavior
- behaviors can be considered adaptations to help a species survive
- taxis = animal behavior; tropism = plant behavior (phototaxis vs. phototropism)



What kingdom does this organism belong to?

Fungi

Is it an autotroph or heterotroph?

its not green!

A roan cow is brown (B) and white (b). What would be the genotypic & phenotypic ratios of the offspring if a roan cow mated with a white cow?

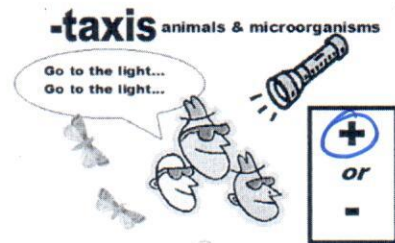
What type of dominance does this represent?

codominance = both show

Energy is lost as heat and matter is recycled.

An organism moving TO the light would exhibit + phototaxis & an organism moving AWAY from the light would exhibit - phototaxis.

moth = + phototaxis
roach = - phototaxis



List 2 differences between aerobic & anaerobic fermentation.

aerobic	anaerobic
w/ O ₂	w/out O ₂
36 ATPs	2 ATPs

social behavior - behavior within a group

Is it innate or learned or both?

Both

List some social insects.

SOCIAL INSECTS



ants
bees
termites

How do ants follow each other?

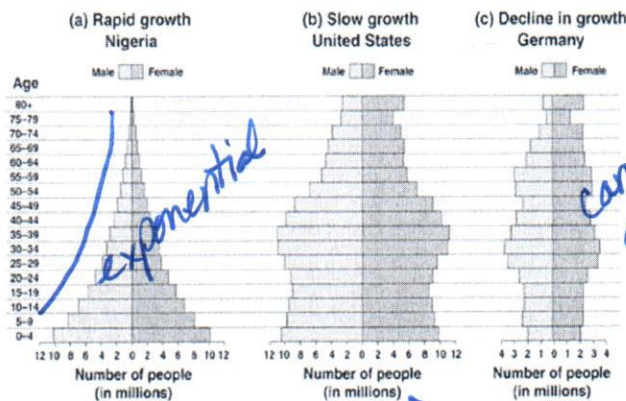
pheromones

Label each description with the correct eukaryotic kingdom or kingdoms:

Plantae, Fungi, Animalia, Protistas, Eubacteria

- Contains autotrophs only: Plantae
- Contains only heterotrophs only: Animalia, Fungi
- Contains gymnosperms and angiosperms: Plantae
- Contains annelid worms, insects, amphibians, and mammals: Animalia
- Contains decomposers: Fungi, Eubacteria

What type of growth is illustrated in these diagrams?



C. Rudolph – CMS

carrying capacity
equilibrium
birth rate = death rate
rate of mortality
reaching demographic transition