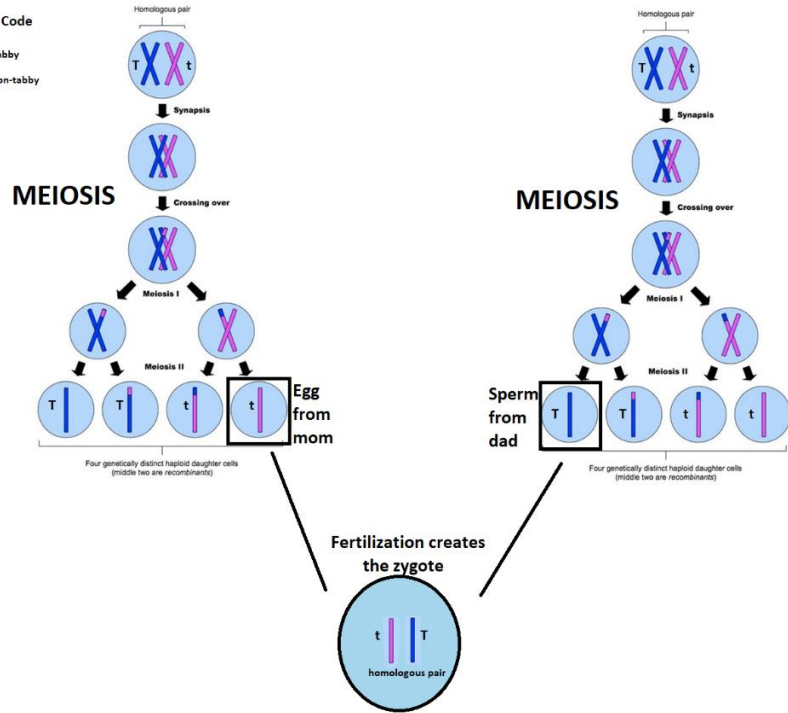


### 3<sup>rd</sup> Nine Weeks Exam Review 2020

**Homologous Chromosomes Code for tabby pattern in cats**  
 - Blue chromosomes = T allele for tabby pattern  
 - Pink chromosomes = t allele for non-tabby pattern



#### Meiosis

1. In humans, what type of cells would be expected to undergo meiosis?

Sex cells/gametes

2. What is the end result of meiosis (include number of cells and chromosome number)?

4 non-identical haploid cells/23 chromosomes

3. The diploid number in humans is 46, how many chromosomes should be present in a typical gamete?

23 chromosomes

4. What does crossing over result in?  
Genetic variation – exchange of DNA
5. Provide an example of a haploid cell.  
Sperm & egg, pollen
6. Provide an example of a diploid cell.  
Somatic cells (bone, skin, muscle)
7. What phase does crossing over occur in?  
Prophase I of Meiosis I

#### Genetics

Dominant (D) or Recessive (R)

D Bb R cc D WW R nn D Aa D TT R yy D Ss D LL

Heterozygous (He) or Homozygous (Ho)

HO DD HO tt HE Gg HO RR HE Ee HO zz HO MM HE Hh HE Ff

Phenotype (P) or Genotype (G)

P Brown hair G Bb G rr P Green eyes P Freckles G YY

## Punnett Squares

In rabbits, brown fur (B) is dominant over white fur (b). Cross two heterozygous brown rabbits and determine what the probability is of producing a white rabbit.

	B	b	
B	BB	Bb	25% white
b	Bb	bb	

In geraniums red flowers (R) are dominant over white flowers (r). Pink flowers are heterozygous. Cross a pink flower with a white flower. Record the possible genotypes and phenotypes from this cross.

	R	r		
r	Rr	rr	R-Red	Pink & white flowers
r	Rr	rr	r-white	
			Rr-pink	

Genotypic ratio: 1:1      **genotypes = Pink and white**

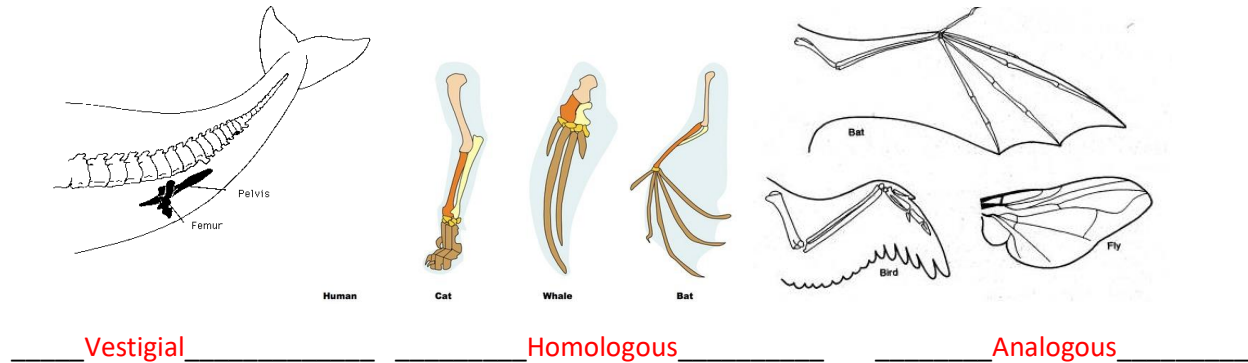
Phenotypic ratio: 1:1      **phenotypes = Rr and rr**

In aliens two antennae is dominant over one antennae and blue spots is dominant over green. Complete the cross for the given genotypes: Aabb x aaBB and determine the phenotype ratios for the potential offspring.

	Ab	Ab	ab	ab	
aB	AaBb	AaBb	aaBb	aaBb	A-two antennae a-one antennae B-blue spot b-green spots  <b>50:50 = 1:1</b>  8-two antennae & blue 8-one antennae & blue
aB	AaBb	AaBb	aaBb	aaBb	
aB	AaBb	AaBb	aaBb	aaBb	
aB	AaBb	AaBb	aaBb	aaBb	

## Evolution

Identify the structures below as analogous, homologous, or vestigial then identify which one is mostly likely to demonstrate common ancestry with a star.



Newest

Fish skeleton	
Shell	
Fern frond	
Leaf from hardwood tree	

oldest

Label which fossil is the oldest and the youngest.

What information can be learned about the environment from the fossils present.

     Once was terrestrial and now aquatic land

What is fossil "stasis"?      no change     

Explain how would the numbers of species in a population change over time if many predators were introduced into the population?

The numbers of species and genetic variation in a population would decrease and fitness would increase

Describe reproductive success and how this increases fitness.

Not all the offspring will survive long enough to reproduce. Some will inherit better traits than others giving them a better chance to survive and pass on their traits to offspring. The offspring will be better adapted to survive.

A population of Canadian geese traveling south flew through a storm. Two of the geese were blown off course and had to land for the night. The next day they heard another population of Canadian geese flying overhead and joined them in their migration. What evolutionary mechanism does the scenario above describe? Explain how do you know?

Gene Flow, geese have joined a different group and migrated with them.

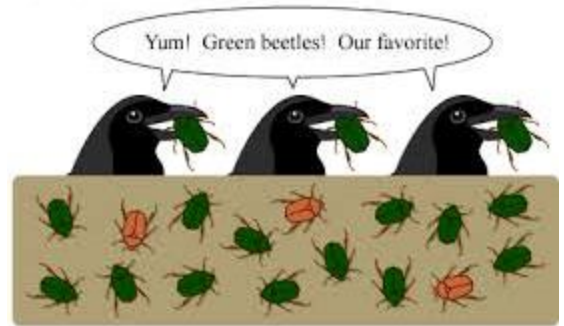
Can individuals evolve? NO What is genetic variation? **Different genes within a population**

Why does natural selection need inherited genetic variation to occur?

**Genetic variation leads to different traits that are inherited, natural selection acts on those phenotypes that are most fit.**

A mutation occurred in a population of rabbits that gave them longer, stronger legs to hop over rock. The grass growing on the top of the rock layer is the food needed for the rabbits to eat to survive. Summarize how does an adaptation will be passed on and become more common in a population over time.

**If the adaptation is beneficial to the organism, then the trait will become more common in a population.**



Explain the image to the right.

**Predators picking on green phenotype beetle, over time brown beetles will become more common.**

The viceroy butterfly mimics the monarch butterfly to

- A. mate with the monarch butterfly
- B. blend into its environment
- C. avoid being eaten by a predator
- D. to attract a mate










**Answer: C**



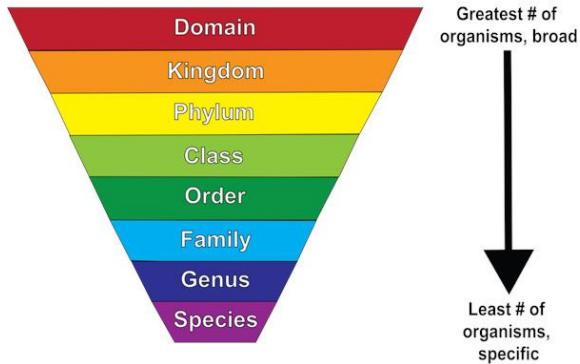
Given the information in the table to the right, which organism is the least like humans?

- A. Rabbit
- B. Fruit Fly
- C. Chimpanzee
- D. Bull Frog

**Answer: B**

Cytochrome c Evolution	
Organism	Number of amino acid differences from humans
 Chimpanzee	0
 Rhesus monkey	1
 Rabbit	9
 Cow	10
 Pigeon	12
 Bullfrog	20
 Fruit fly	24
 Wheat germ	37
 Yeast	42

## Taxonomy



1. Why is a universal taxonomy system needed in the scientific community?

To avoid confusion when identifying organisms

2. What is your saying used to remember the levels of taxonomy?

Did king Phillip come over for great spaghetti / Do Kings Play Chess On Fine Grain Sand / or your own

3. What are the levels of taxa from most to least inclusive?

Domain, kingdom, phylum, class, order, family, genus, species

4. What two taxa make up an organism's scientific name?

Genus & species    *Genus species*

5. Are different species in the same family more or less closely related than species in the same class?

Explain. Species in the same family are more closely related, the further down the taxa is from

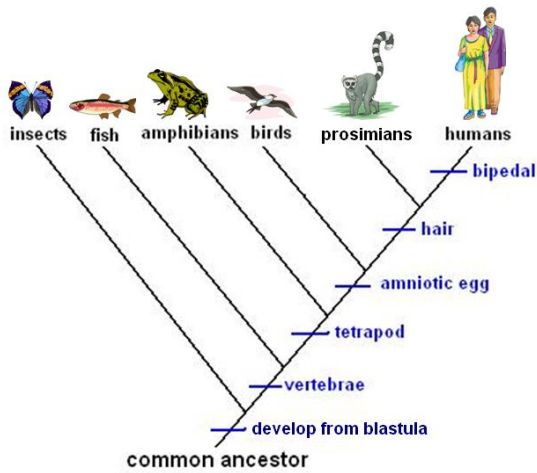
Domain, the organisms become more related. Ex. Wolves (*Canis lupus*) are closely related to dogs

(*Canis familiaris*)

6. If organisms share the same order, what other taxa do they share?

Domain, Kingdom, Phylum, Class (all are above Order)

## Cladograms



Use the cladogram below to answer the questions.

- a. Which pair of organisms is most closely related: amphibians and birds or amphibians and insects. Explain.

Amphibians & birds, insects do not have vetebrae

- b. What trait(s) do humans and birds have in common?

developed from blastula, Vetebrae, tetrapod, amniotic egg

- c. Who is more closely related: fish and amphibians or birds and amphibians? Explain how you know.

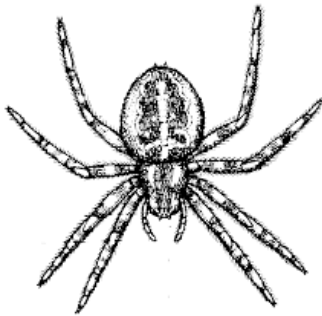
Amphibians & birds, share 3 same characteristics of blastula, vetebrae and tetrapod

- d. What trait(s) do all of the organisms share?

Developed from blastula

## Dichotomous Key

Identify the organism:  Hackledmesh Weaver



- |  |                       |
|--|-----------------------|
| 1a. Has 6 legs                             | ...Class Insecta      |
| 1b. Has 8 legs                             | ...Go to #2           |
| 2a. Has hour-glass shape on the abdomen... | Black Widow           |
| 2b. Has no hour-glass shape on abdomen...  | Go to #3              |
| 3a. Has an oval abdomen                    | ...Hackledmesh Weaver |

1. What is a host cell? Why does a virus use a host?

A cell that has been introduced with genetic material from a virus, viruses are not living and need a host to replicate

2. Glycoproteins are projections on the surface of a virus. They are host specific. How do these projections help a virus?

Glycoproteins recognize the host cell of each particular virus and lock on (attach) to the correct host cell.

3. A capsid is a protective layer in a virus. What is the capsid protecting?

The capsid protects the virus's genetic material

4. List 3 characteristics to describe the Lytic Cycle and 3 more to describe the Lysogenic Cycle.

Lytic-replicates within days, destroys host cell Example: Flu/cold

Lysogenic - remains dormant before copies genome, can take months or years to develop Example: HIV/Chicken pox

