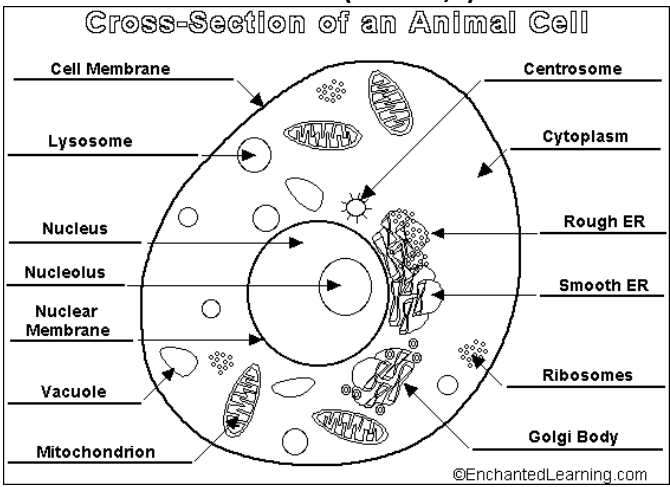
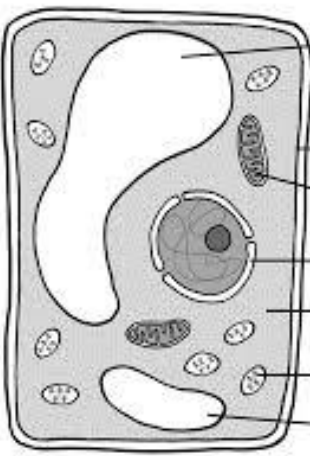
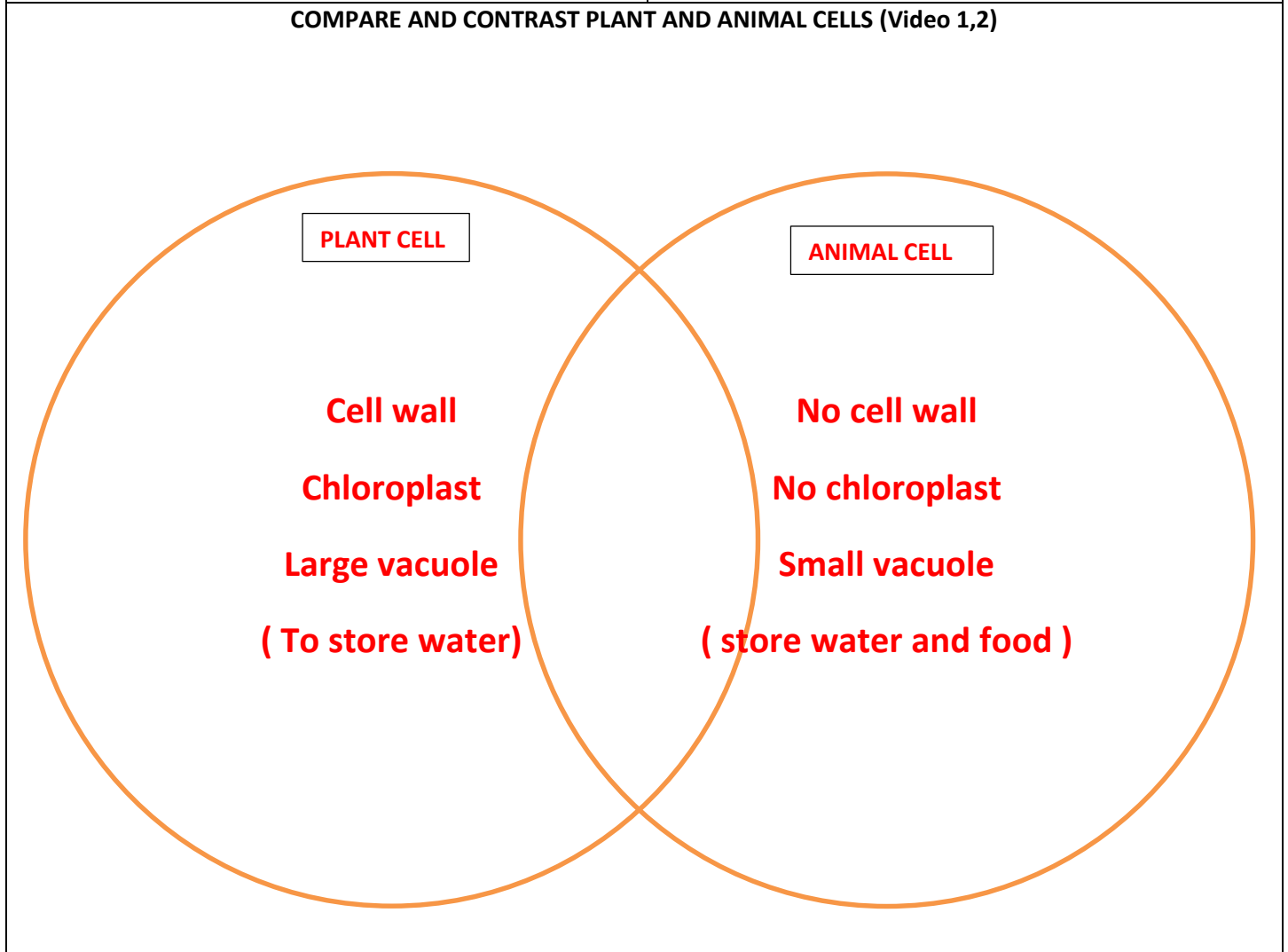


7th Grade SOL Review Packet (Revised 2016 by CB)

Animal Cell (Video 1,2)	Plant Cell (Video 1,2)
<p style="text-align: center;">Cross-Section of an Animal Cell</p>  <p>Labels for Animal Cell:</p> <ul style="list-style-type: none"> Cell Membrane Lysosome Nucleus Nucleolus Nuclear Membrane Vacuole Mitochondrion Centrosome Cytoplasm Rough ER Smooth ER Ribosomes Golgi Body <p style="text-align: right; font-size: small;">©EnchantedLearning.com</p>	 <p>Labels for Plant Cell:</p> <ul style="list-style-type: none"> vacuole cell wall cell membrane mitochondrion nucleus cytoplasm chloroplast vacuole

COMPARE AND CONTRAST PLANT AND ANIMAL CELLS (Video 1,2)



Name: _____

Block: _____

Organelles

(Videos 3 to 6; Quizlet: http://quizlet.com/_gm562; http://quizlet.com/_8wfla)

Write the function of each cell organelle:

Cell Membrane: **skin of the cell – keep things in and out**

Cytoplasm: **Jelly substance that fill the cell**

Nucleus: **Brain of the cell**

Cell Wall: **Wall – stiff outer layer in plant cells**

Vacuole: **Storage if food and water**

Mitochondrion: **power house of the cell**

Endoplasmic reticulum: **transportation system**

Chloroplast: **Uses sun’s energy to make sugar to feed plants**

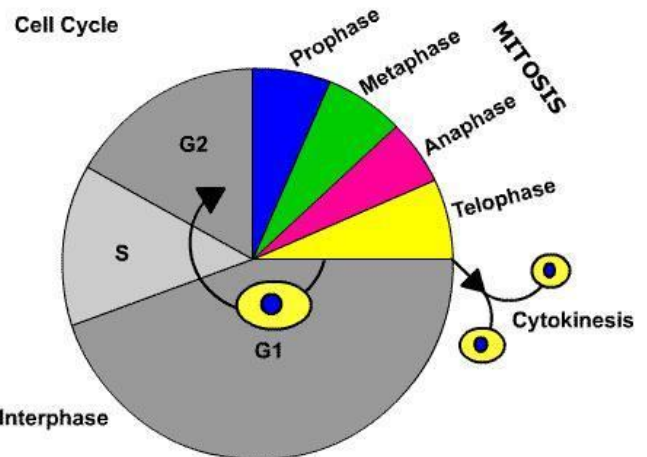
Cell Theory (Videos 7 and 8)

1. All living things are made up of **Cells**
2. All living cells come from **pre-existing cells**
3. The cell is **the basic** unit of life.

Timeline for Cell Theory:

Cell Cycle (Videos 7 and 8)

Follow along the diagram as you watch the video



How will you remember the phases of the cell cycle. Take notes below:

Mitosis vs. Meiosis (Video 9)

Mitosis:

1. Produce new cells for growth and repairs
2. Produce two identical cells of the original cell

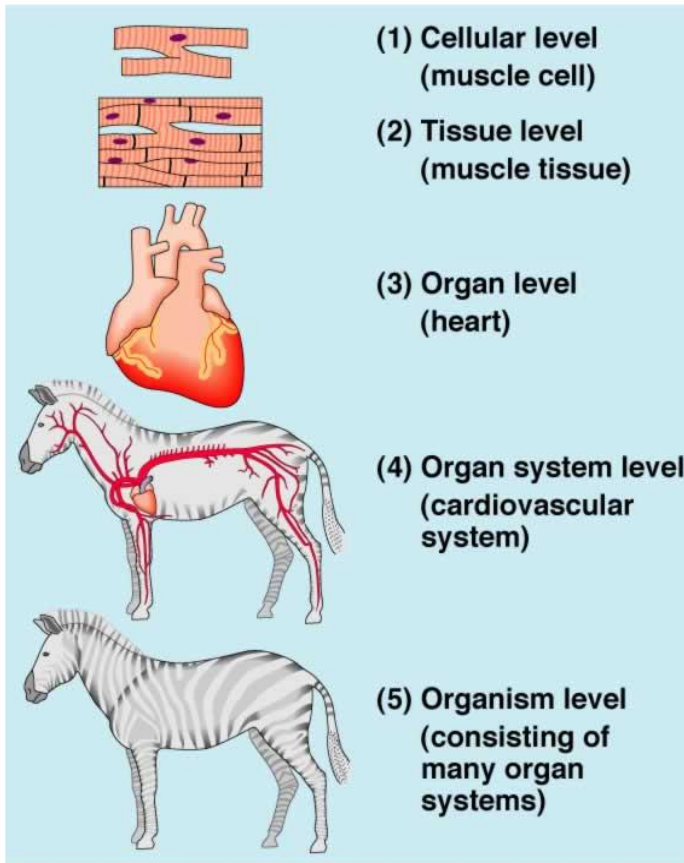
Meiosis:

1. Produces reproductive cells that carries half of the genes .
2. Material of the parent cell

Name: _____

Block: _____

Hierarchy of Organ Systems: Cell-tissue-organ-organ system-organism



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Unicellular vs. Multicellular Organisms (Video 12)

Unicellular: Organism made of only one cell.

Example: bacteria , algae, protozoa

Multicellular: Organism made of many cells.

Example: Animals , plants, and fungi

Necessities for ALL Life

Food

Water

Air (Oxygen)

Space= Shelter and Space ; territory

Characteristics of ALL Living Things
(Quizlet: http://quizlet.com/_g8e1q)

Composed of cells: membrane –covered structure contains life

Grow & Develop: Produce more cells by sexual and asexual reproduction

Stimulus Response (homeostasis): maintenance of stable internal environment

Reproduce: make more like itself

Have DNA: heredity material controls the cells

Use Energy (metabolism): combined chemical processes in organism

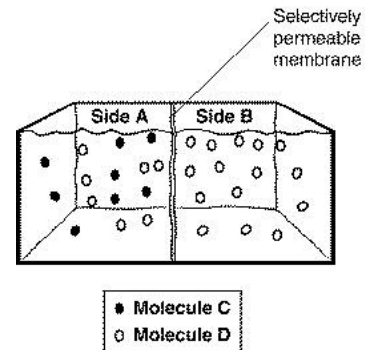
Osmosis / Diffusion

(Videos 10 to 11; Quizlet: http://quizlet.com/_hro2a)

Osmosis: particles move from high concentration to low concentration area through a permeable membrane.

Diffusion: Particles move from high concentration to low concentration area .

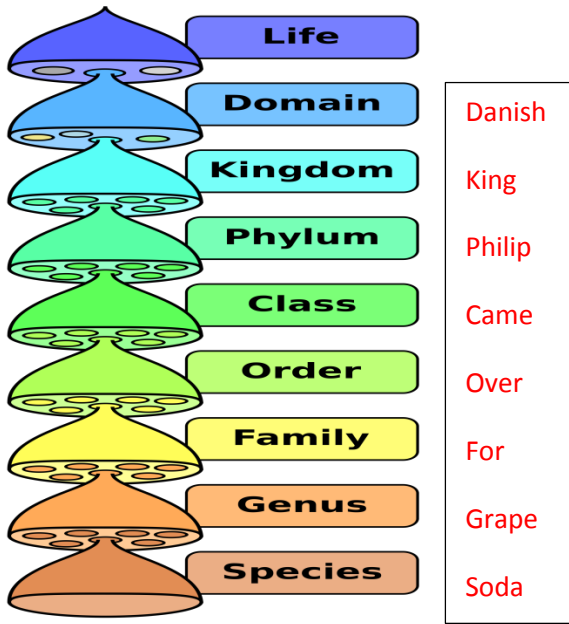
Selective Permeability: certain particles will be able to move through the membrane



Name: _____

Block: _____

Hierarchy of Life (Video 12)



Domains of Life (Video 12; Quizlet: https://quizlet.com/_bqcps)

Bacteria: Unicellular organisms with no nucleus
Archaea: Unicellular organisms with no nucleus and live in extreme conditions
Eukarya: has nucleus

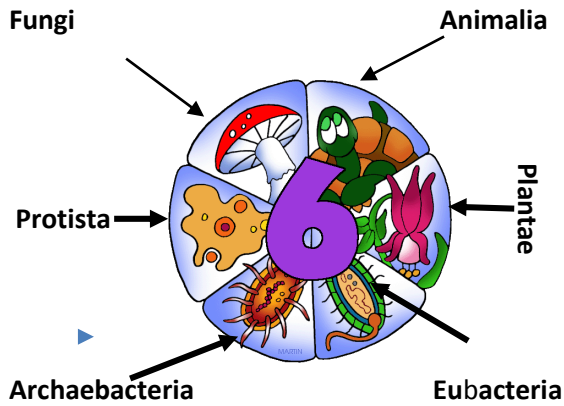
Naming Species

Genus – Species (*Tursiops truncatus*) for Bottlenose dolphin

Genus is capitalized, species is lower case (Italicized if typed and underlined, if handwritten)

Named in Latin

6 Kingdoms of Life



Example Phylum of Animals (with an example) (Videos 14 and 15)

F	Cnidaria	Jelly like animals that have a bell or umbrella shape	
E	Chordates	Animals that have a notochord that supports the body (or a backbone)	
D	Mollusca	Soft bodied animals usually have a shell	
A	Arthropod	They have three body parts, jointed legs, and a tough exoskeleton	
B	Echinoderm	These marine animals have plates with spines	
C	Annelids	Long animals divided into segments	

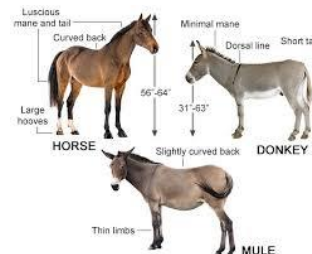
Phylum of Plants (Video 13)

Moss (Bryophytes): no roots , non- vascular , reproduce with spores
Ferns (Pteridophytes): has roots , vascular plants, reproduce with spores .
Conifers (Gymnosperms): have cones and not flowers, seeds are not enclosed in fruits
Flowering Plants (Angiosperms): have flowers , seeds are enclosed in fruits.

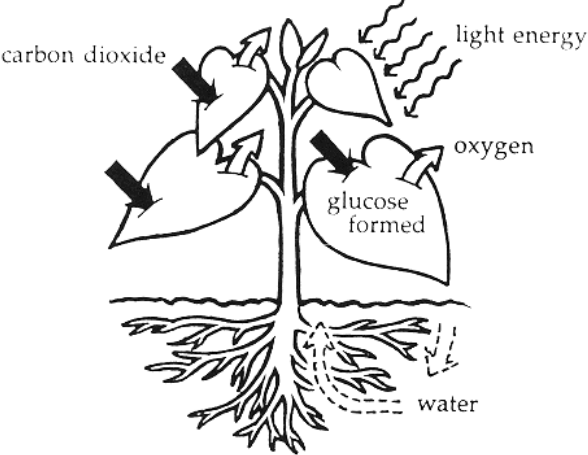
Definition of a Species (Video 12)

Species: Under natural condition, two life forms can breed and produce fertile offspring which can make offspring too.

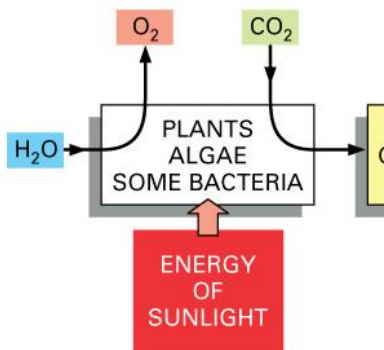
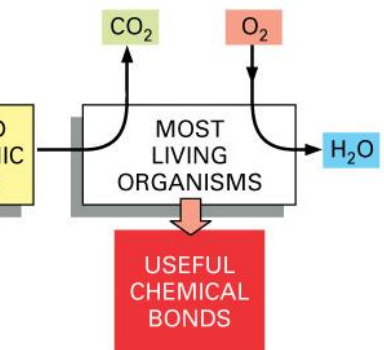
Example: A mule is a crossbreed between a horse and donkey. However it is sterile and therefore not a new species.



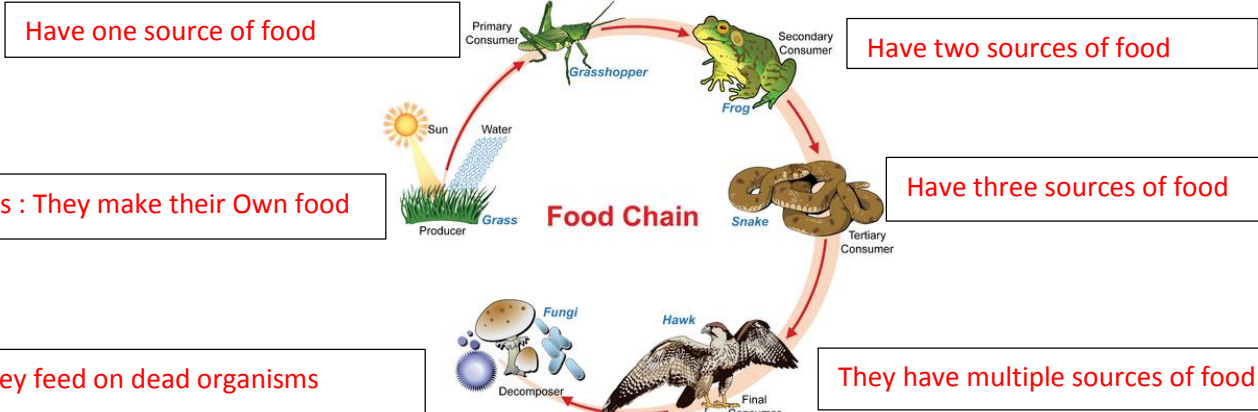
Photosynthesis and Respiration Quizlet: <https://quizlet.com/29397684/reactants-of-photosynthesis-and-cellular-respiration-flash-cards/>

<p>Photosynthesis (Videos 16 and 17)</p> 	<p>Photosynthesis Chemical Equation (Video 16 and 17)</p> <div style="border: 2px solid blue; padding: 10px; margin: 10px 0;"> <p style="text-align: center;">Photosynthesis</p> $6\text{CO}_2 + 6\text{H}_2\text{O} \longrightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2$ <p style="text-align: center;">carbon dioxide + water \longrightarrow glucose + oxygen</p> </div> <p>Chemical/Organelle Responsible for Photosynthesis</p> <p>Chlorophyll: this is what gives the plant the green color</p> <p>Chloroplast: chlorophyll is found in chloroplast</p>
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Photosynthesis vs. Respiration (Videos 16 and 17)

<p>PHOTOSYNTHESIS</p> $\text{CO}_2 + \text{H}_2\text{O} \rightarrow \text{O}_2 + \text{SUGARS}$ 	<p>RESPIRATION</p> $\text{SUGARS} + \text{O}_2 \rightarrow \text{H}_2\text{O} + \text{CO}_2$ 
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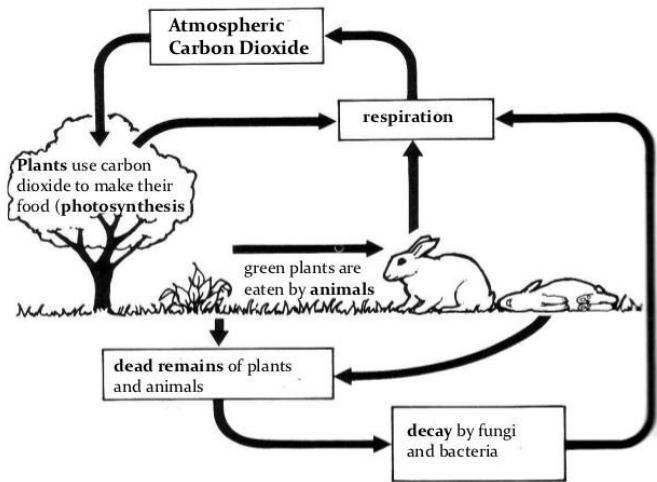
Role of Photosynthesis in the Food Web (Videos 16, 17, 24, 25)



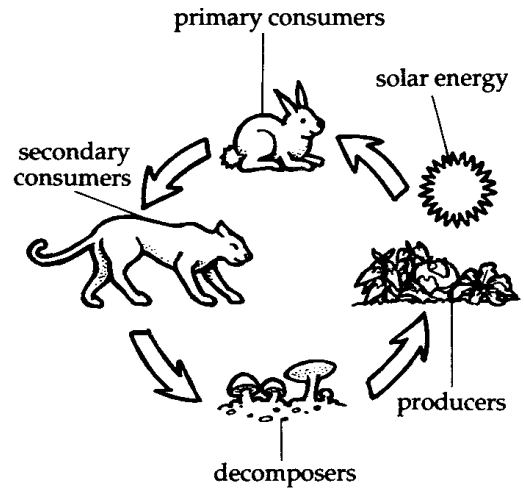
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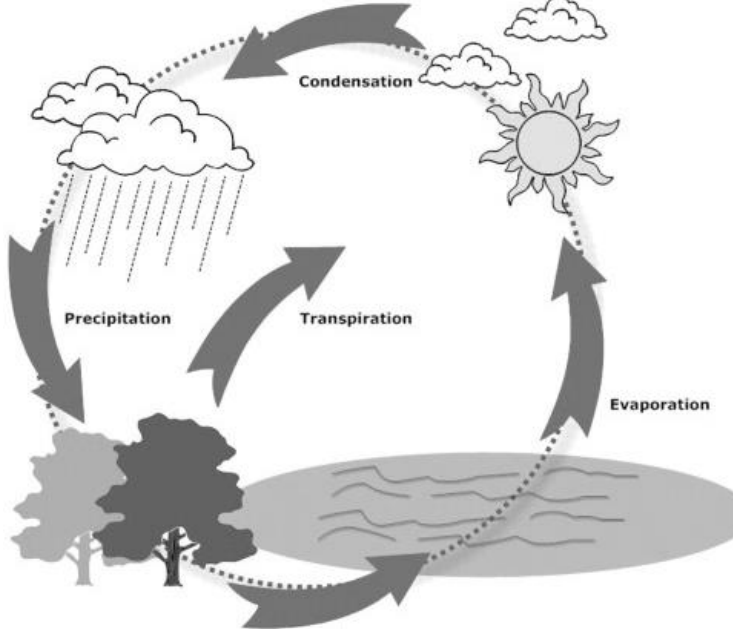
Carbon Cycle (Videos 18 and 19)



Food Chain (Videos 24 and 25)



Water Cycle (Videos 20 and 21)



Biotic vs. Abiotic Factors (with examples)

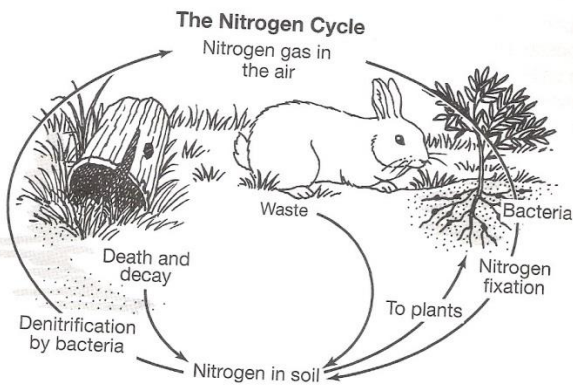
Biotic: Living things

Examples: animals and plants

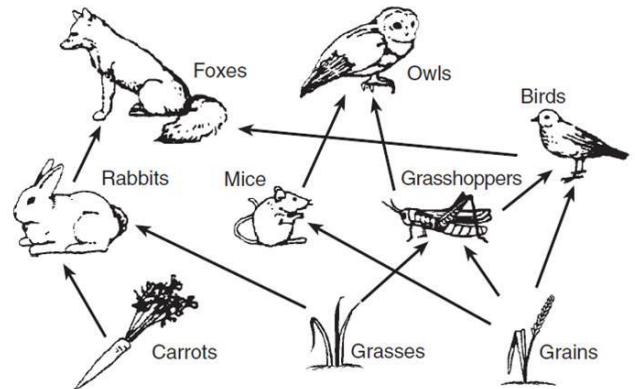
Abiotic: Non - living things

Examples: sunlight , water , soil, and air

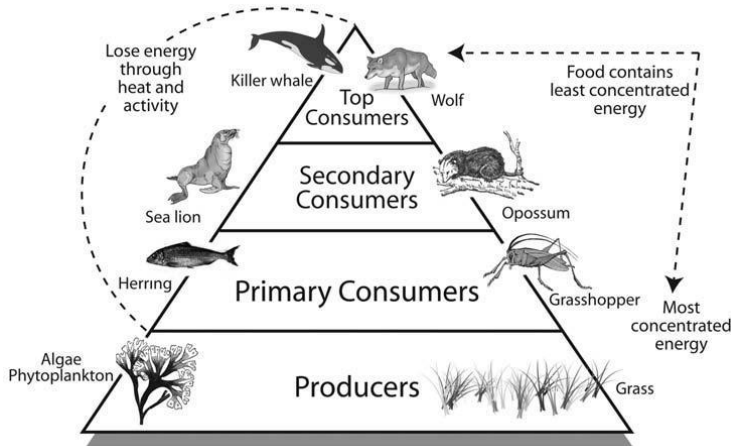
Nitrogen Cycle (Videos 22 and 23)



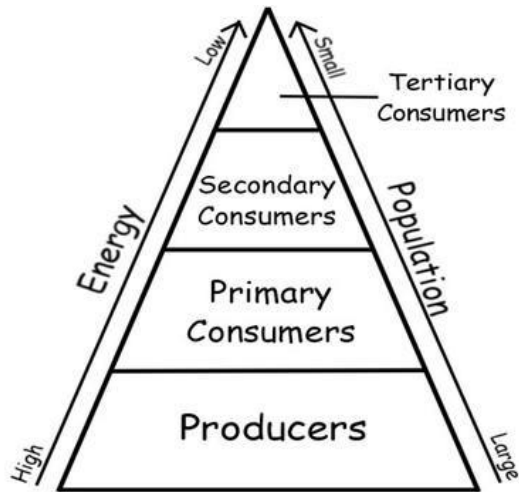
Food Web (Videos 24 and 25)



Energy Pyramid (Videos 26, 27)



There is **energy loss** as you go up each level of the energy pyramid. **Organisms use 90% of the energy** with which they start to maintain their bodily functions. **Only 10% of that energy transfers** to the next level. For example, if a plant has 1,000 calories (1 kcal) available in it, a cow would only get 100 cal to use. A fox would get 10 cal from the mouse. At the top, a wolf would get 1 cal from the fox.



Population Interactions

Species in an ecosystem may **compete** with each other for

1. Basic Resources (food & water)
2. Mates
3. Territory

Species in an ecosystem may **cooperate** with each other for

1. Meeting basic needs

Animals Basic Needs

1. Food
2. Water
3. Gases (Oxygen)
4. Space

Name: _____

Block: _____

Symbiotic Relationship (Video 29)

Table 1 – Impact of symbiotic relationships on organisms.

Relationship	Self	Opponent
Commensalism	Benefit	Neutral
Mutualism	Benefit	Benefit
Parasitism	Benefit	Harm
Predation	Benefit	Harm

Symbiotic Examples (Video 29)

- Commensalism: Bird nesting in an old rabbit hole**
- Mutualism: bird eating bugs off an antelope**
- Parasitism: A tick on a dog**
- Predation: Lion eating a gazella**

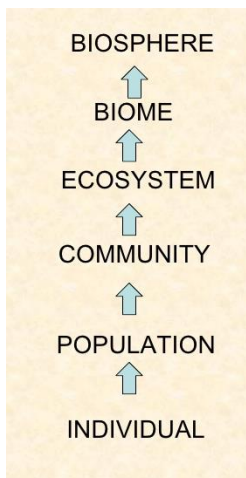
Role of Organisms for Energy Transfer (Video 26)

Producer: They make their own food

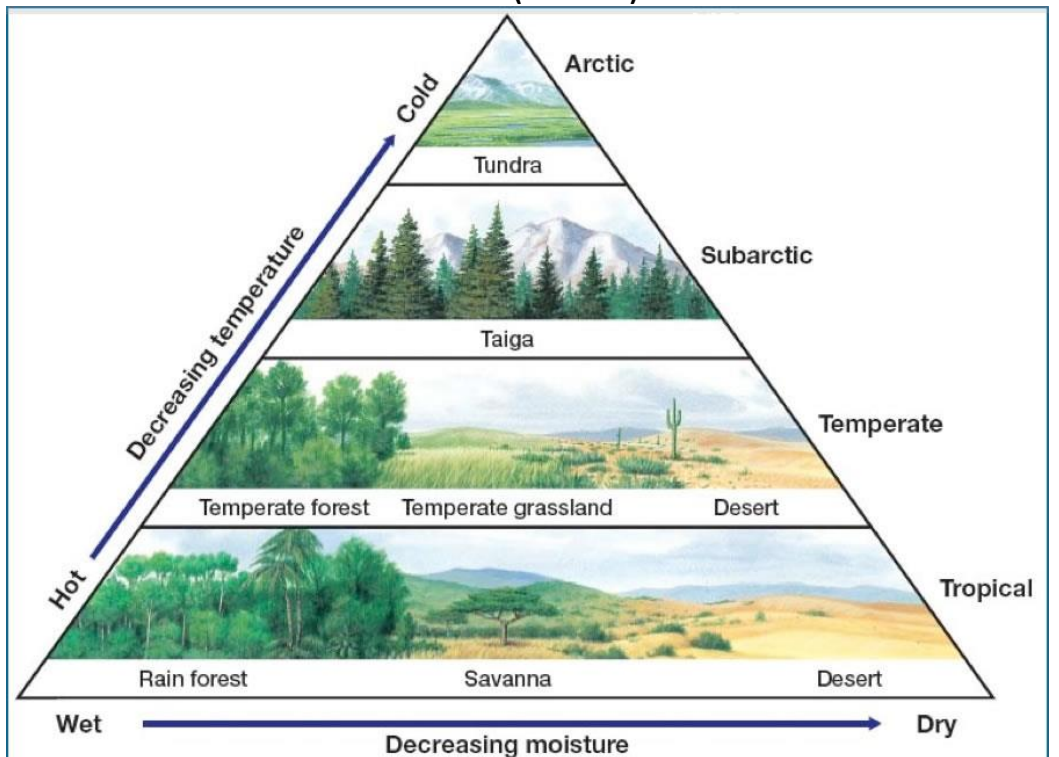
Consumer: They do not make their own food, they depend on other organisms

Decomposer: They feed on dead bodies.

Ecosystem vs. Biomes (Videos 30, 31)

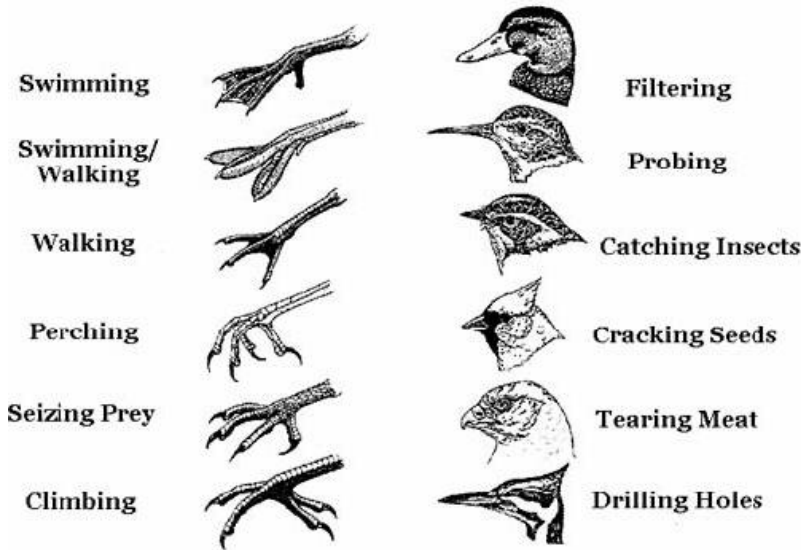


Biomes (Video 31)



Adaptations to meet niches in Ecosystem (Video 32, 33, 34)

Bird Beaks and Feet



Abiotic Factors that affect life Daily, Seasonally or Long Term.

Daily: Phototropism – Plants grow towards sunlight

Seasonally: Hibernation – animals sleep during winter- the heart rate slows down

Long Term: Eutrophication – overgrowth of plants like algae due to extra nutrients

Climate Change – global warming – Increase of temperature due to pollution

**Human interaction with Ecosystems (Quizlet:
<https://quizlet.com/23052973/ecology-flash-cards/>)**

1. Humans are a natural part of the ecosystem and use it to meet their basic needs.
2. Humans both positively and negatively affect the ecosystem.
3. **Examples of How Humans Interact with Ecosystem: Positively: Recycle, plant more trees**
Negatively : Littering, cutting trees, burning coal, ...etc.

DNA (Video 38)

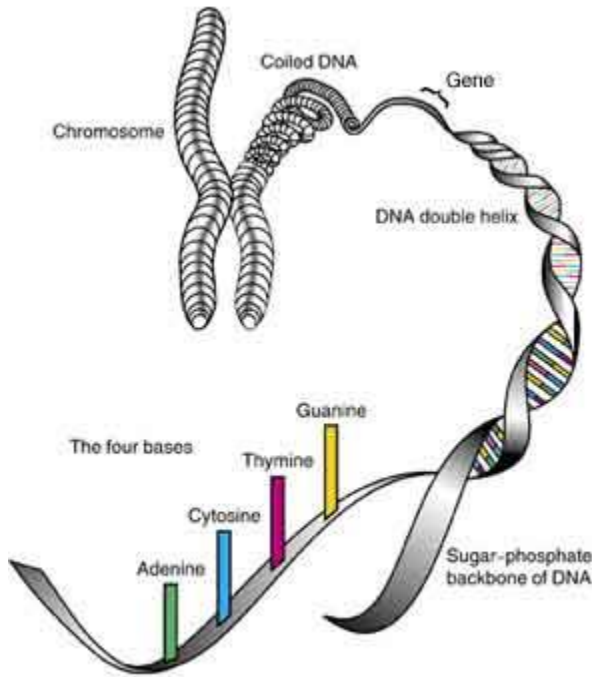
1. **Double Helix**
2. Made of Sugars, Nitrogen Bases and Phosphates
3. Arrangement of Nitrogen Bases forms a **genetic code**.



Name: _____

Block: _____

DNA Hierarchy (Video 38; Quizlet: http://quizlet.com/_apqlo)



Mendelian Genetics (Video 39)

1. Genetic Material is passed down through generations.
2. Genetic Traits can have variations (Dominant and Recessive)
3. Traits that are expressed through genes can be inherited. Characteristics that are acquired through environmental influence (like a scar) cannot.

Genotype vs. Phenotype (Video 39; Quizlet: <https://quizlet.com/17211443/heredity-flash-cards/>)

Genotype:

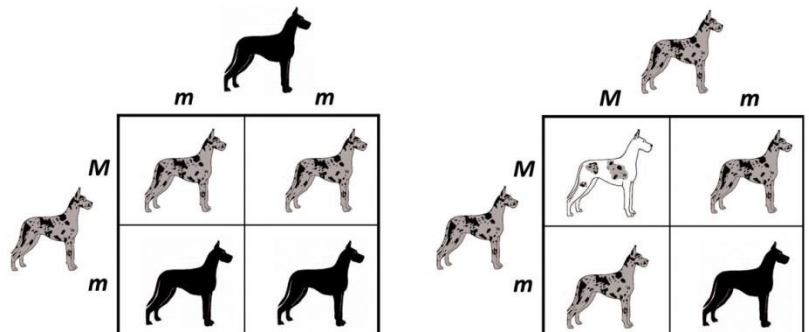
Phenotype: **The physical appearance of the organism**

Punnett Square (Video 39, 40, 41)

Alleles: **Set of genes**

Homozygous Allele: **Both alleles are the same**

Heterozygous Allele: **alleles are different**



Scientific Contribution to DNA (Video 38)

Scientist	Contribution
Mendel	Genes come in pairs and can be inherited
Franklin	Double Helix Structure
Watson & Crick	Chemical Components of DNA

Adaptation and Extinction (Video 32, 33, 34)

Environmental Changes may cause organism to adapt or die off through natural selection.

Natural Selection is the survival and reproduction of individuals in a population that exhibit traits that **best enable them to survive** in their environment.

Adaptation vs. Mutation (Video 32, 33, 34; Quizlets: http://quizlet.com/_b2zvi; http://quizlet.com/_ba7kn)

Mutation: A change in trait for a single organism
Adaptation: A beneficial mutation that passes down from one generation to the next

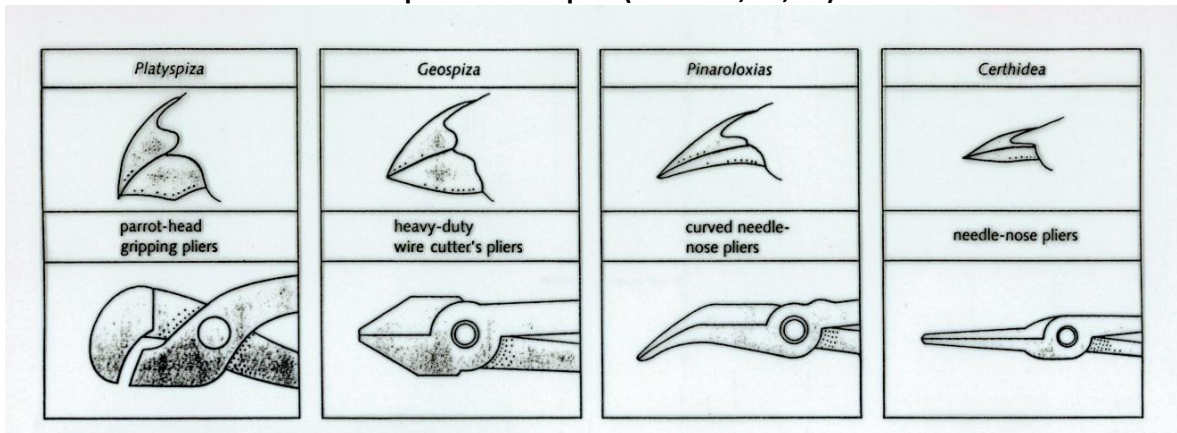
Evolutionary Evidence (Video 35, 36)

1. Fossil Record
2. Radiometric Dating
3. Genetic Information
4. The distribution of organism
5. Development of similar traits across species.

Name: _____

Block: _____

Adaptation Examples (Video 32, 33, 34)



What caused the changes in population from Generation 1 to Generation 3? (Hint: It has to do with trees.)

Pollution made it darker.

Helpful and Harmful Mutations (Videos 38 to 43)

Generation 1



Generation 2



Generation 3



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Name: _____

Block: _____

Cell Theory Timeline

1665

1673

1838

1839

1858

Robert Hook

Anton Van
Leeuwenhoek

Matthias Schleiden

Theodore Schwann

Rudolf Virchow

Named "Cells"

Saw animalcules
with microscope

German Scientist

German Scientist

German Doctor

Saw cork in
microscope

First to see
bacteria

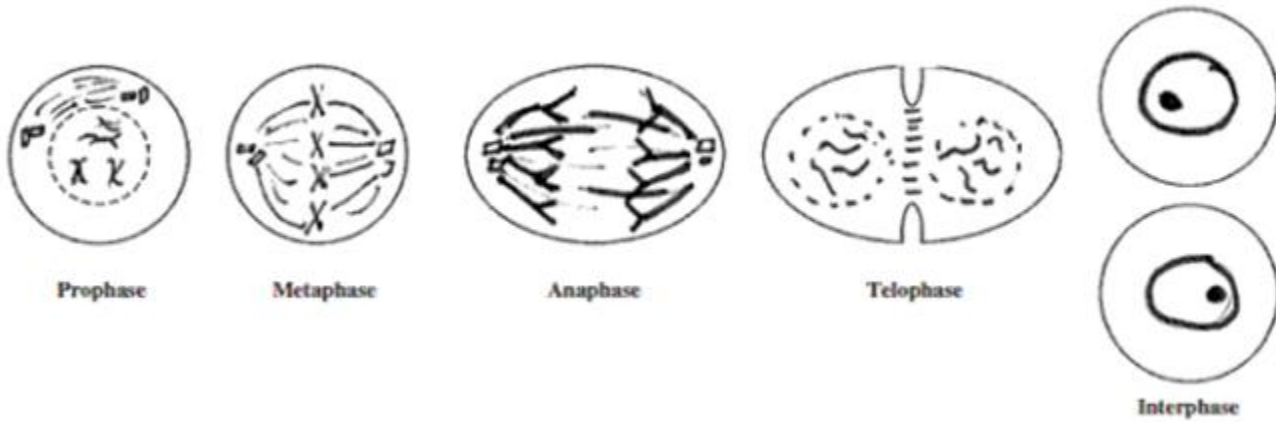
1. all organism are
composed of one
or more cells

2. The cell is the
basic unit of life

3. All cells came
from existing cells

Cell theory

Stages of mitosis



<p>1. Interphase</p> <ul style="list-style-type: none"> ❖ Chromosomes and other materials are copied ❖ Centrioles are also copied ❖ Cell does actual “cell” job ❖ Longest phase 	<p>2. Prophase</p> <ul style="list-style-type: none"> ❖ Nuclear membrane breaks apart ❖ Chromosomes thicken and shorten ❖ Centrioles move to the opposite side of the cell ❖ Fiber from between the two pairs of centrioles connect to the chromosome’s centromere 	<p>3. Metaphase</p> <ul style="list-style-type: none"> ❖ Chromosomes line up at the equator or the middle of the cell
<p>4. Anaphase</p> <ul style="list-style-type: none"> ❖ Chromatids separate and pull apart to opposite sides of the cell 	<p>5. Telophase</p> <ul style="list-style-type: none"> ❖ The nuclear membrane forms around two sets of chromosomes ❖ Chromosomes unwind ❖ Fibers disappear ❖ Cell are still connected but have “pinched “ area 	<p>6. Cytokinesis</p> <ul style="list-style-type: none"> ❖ Cells full break apart and complete ❖ Result in two identical daughter cells ❖ Right after reproduction and immediately before growth stage

Punnett Square

Complete the following monohybrid crosses: draw a Punnett square, list the ratio and describe the offspring. Be sure to remember that the **capital letter is dominant**.

Example)

A green pea plant (GG) is being crossed with a green pea plant (Gg).

	G	G
G	GG	GG
g	Gg	Gg

GenoType= 2 GG: 2 Gg ; 0 gg

Phenotype= 4 Green pea plants: 0 other color

- 1) A green pea plant (Gg) is crossed with a yellow pea plant (gg).

- 2) A tall plant (TT) is crossed with a tall plant (Tt).

- 3) A tall plant (Tt) is crossed with a short plant (tt).

- 4) A red flower (Rr) is crossed with a white flower (rr).

- 5) A white flower (rr) is crossed with a white flower (rr).

- 6) A black chicken (BB) is crossed with a black chicken (BB).

Name: _____

Block: _____

Complete the following problems. List the parent genotypes, draw and fill in a Punnett square, and then list the offspring genotypes and phenotypes.

1. A homozygous dominant brown mouse is crossed with a heterozygous brown mouse (tan is the recessive color).

2. Two heterozygous white (brown fur is recessive) rabbits are crossed.

3. Two heterozygous red flowers (white flowers are recessive) are crossed.

4. A homozygous tall plant is crossed with a heterozygous tall plant (short is the recessive size).

5. A heterozygous white rabbit is crossed with a homozygous black rabbit.