Life Science

8th Grade Science
Pearl Junior High School

3.a. Adaptations: traits that help survival & reproduction

- Desert- nocturnal, needles on plants, large ears, burrow underground
- Aquatic- long bodies, fins, gills, webbed feet, leaves that float
- High altitude (mountains) - low oxygen
- Cold climate- white fur, hibernation, fatty insulation, trees have needles

3.b. Cells

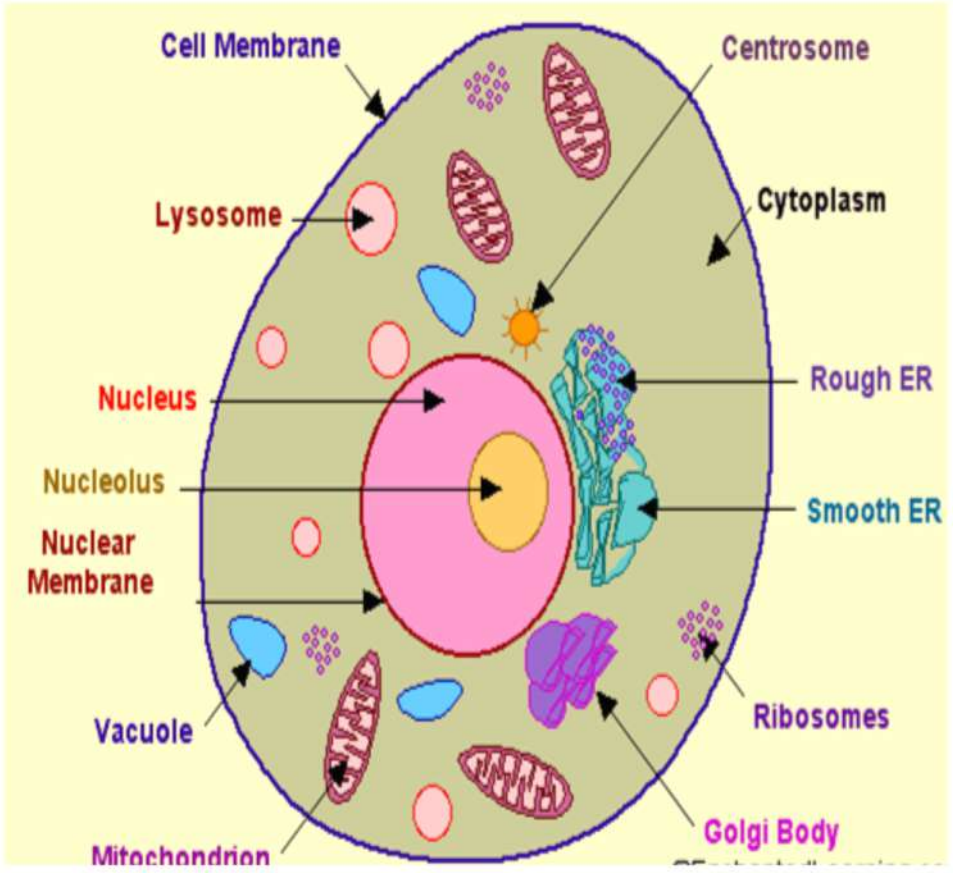
- Differences in plant and animal cells:
- Plant cells have:
  - Cell walls
  - One large central vacuole
  - Chloroplasts for photosynthesis

3.b. Cells

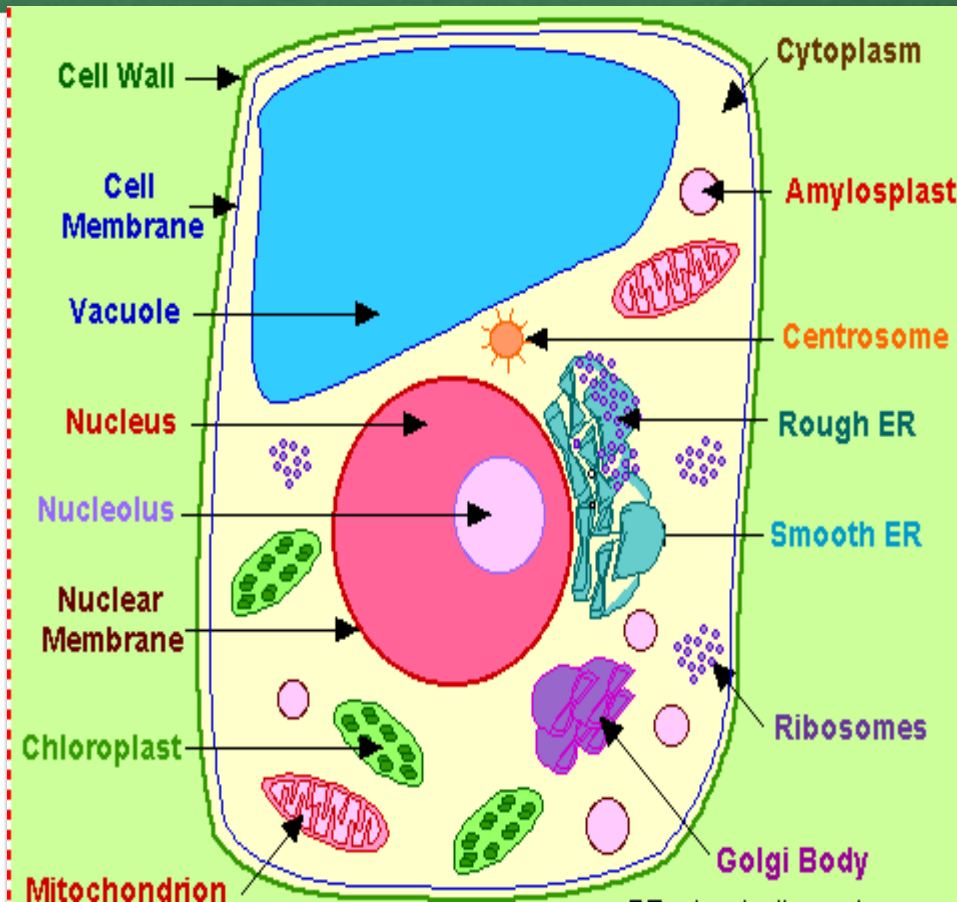
- Structures/Organelles:
  - Nucleus: controls activities, DNA
  - Cytoplasm: gel-like substance in cells
  - Cell membrane: controls what enters and exits
  - Mitochondria: respiration (energy for the cell to function)
  - Chloroplast: photosynthesis in plant cells

3.b. Cells

Animal Cell



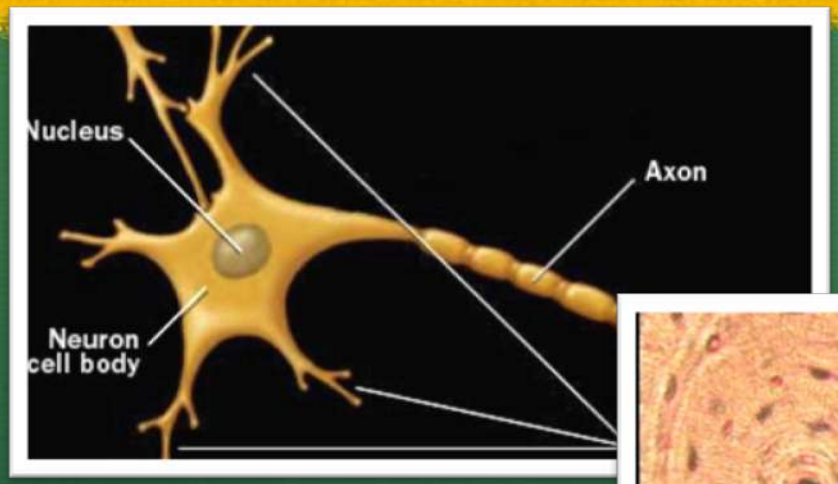
Plant Cell



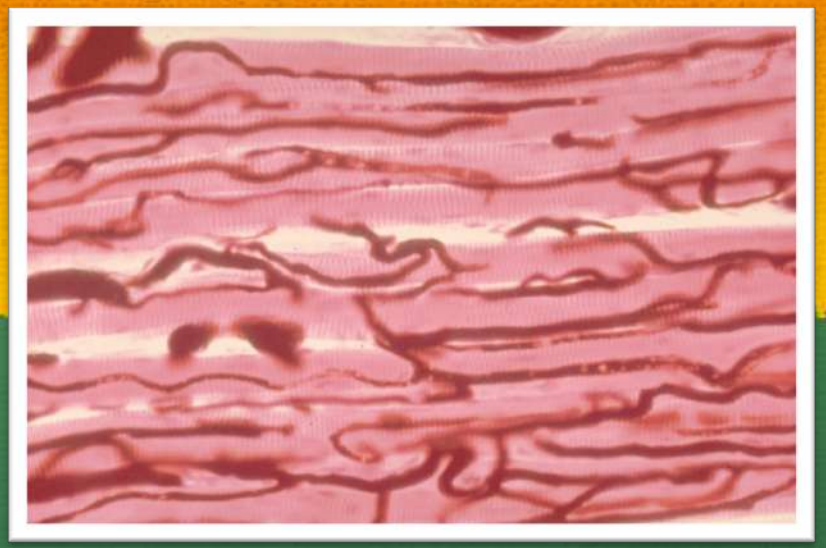
3.b. Cells

- Types of cells:
  - Nerve- transmit information, found in brain, control senses
  - Bone- provide shape and support
  - Blood- carry materials all over body
  - Muscle- movement
  - Epithelial- protection, found in skin

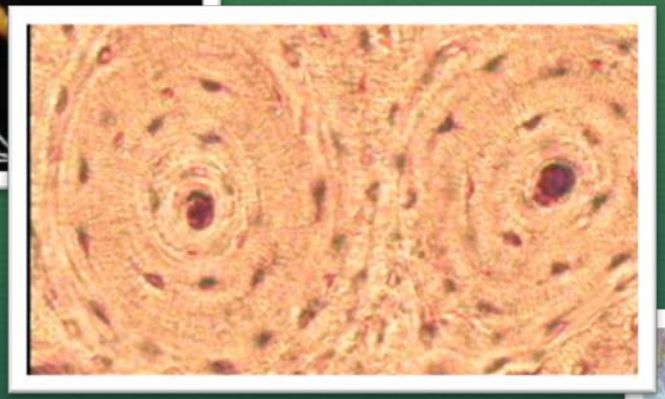
3.b. Cells



Nerve cell



muscle



bone

epithelial

blood

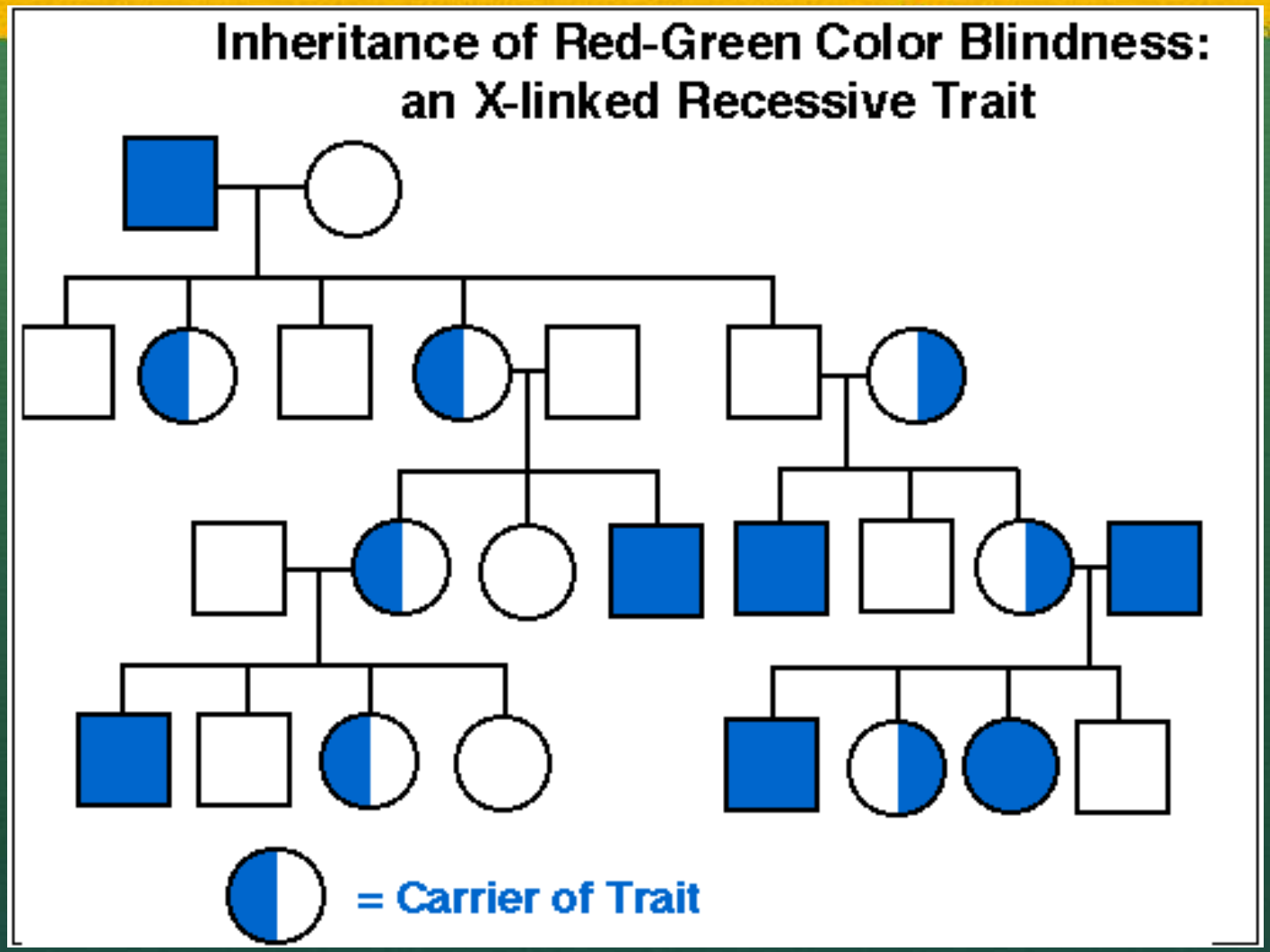
3.c. Diseases

- Viral- cold, influenza, HIV, chicken pox
- Bacterial- tetanus, pneumonia, strep
- Fungal- athlete's foot, ringworm
- Parasite - malaria
- Antibiotics treat bacterial diseases, NOT VIRUSES.
- May be spread through direct contact, body fluids, food, water, or animals.

3.d. Heredity

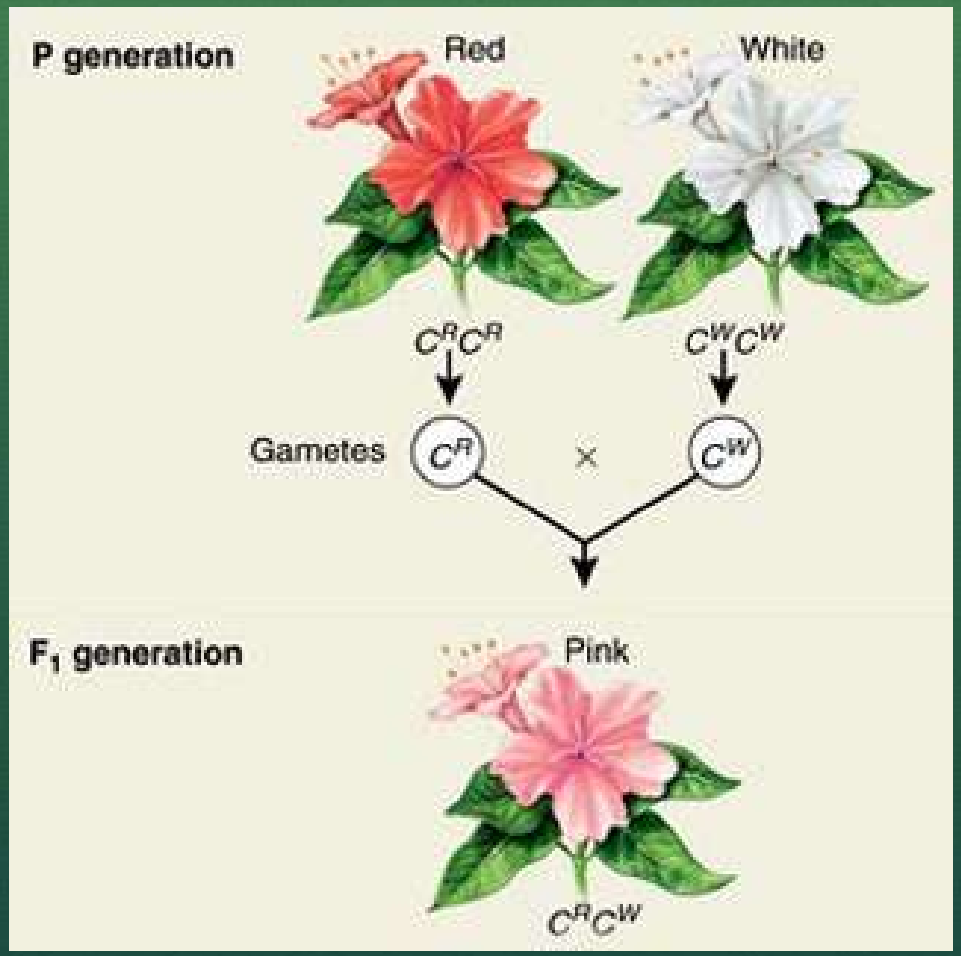
- Phenotype: physical appearance
- Genotype: two alleles (letters)
- Pedigree: chart that shows traits in a family
  - Shaded- expresses trait
  - Half-shaded- carries but does not express
  - Clear- does not carry or express

Pedigree


Inheritance of Red-Green Color Blindness:
an X-linked Recessive Trait
= Carrier of Trait

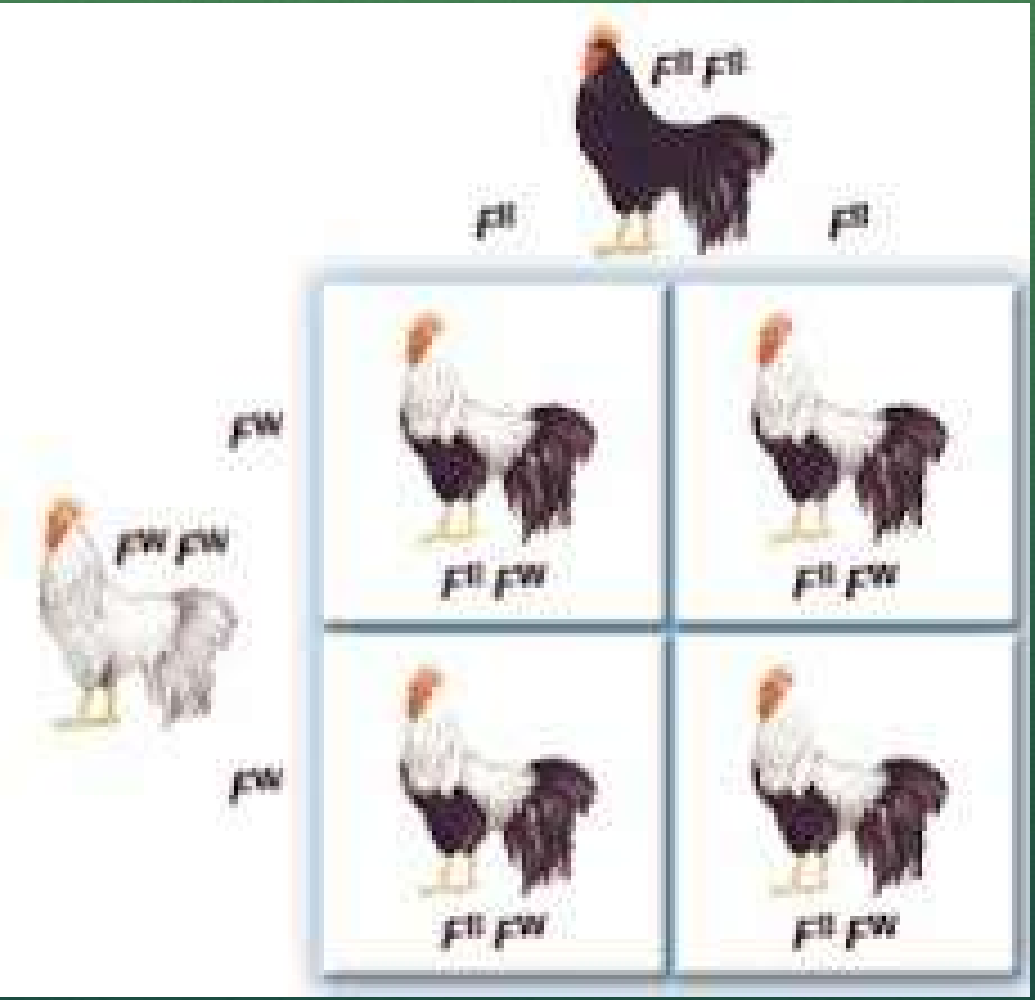
3d. Incomplete dominance shows blended traits

Red and white flowers = pink flowers

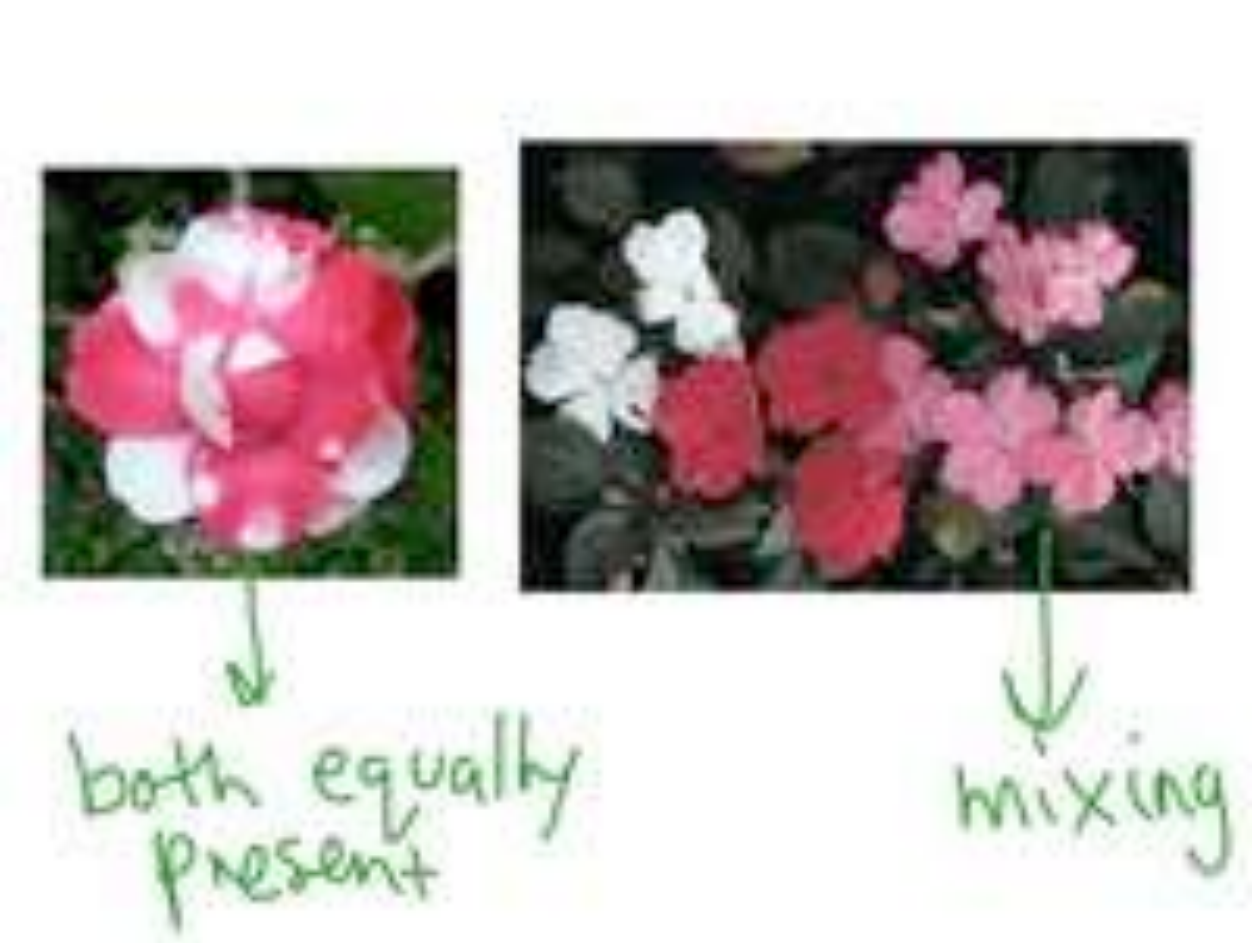


3d. Codominance: both are expressed

Black chicken + white chicken = black and white chicken



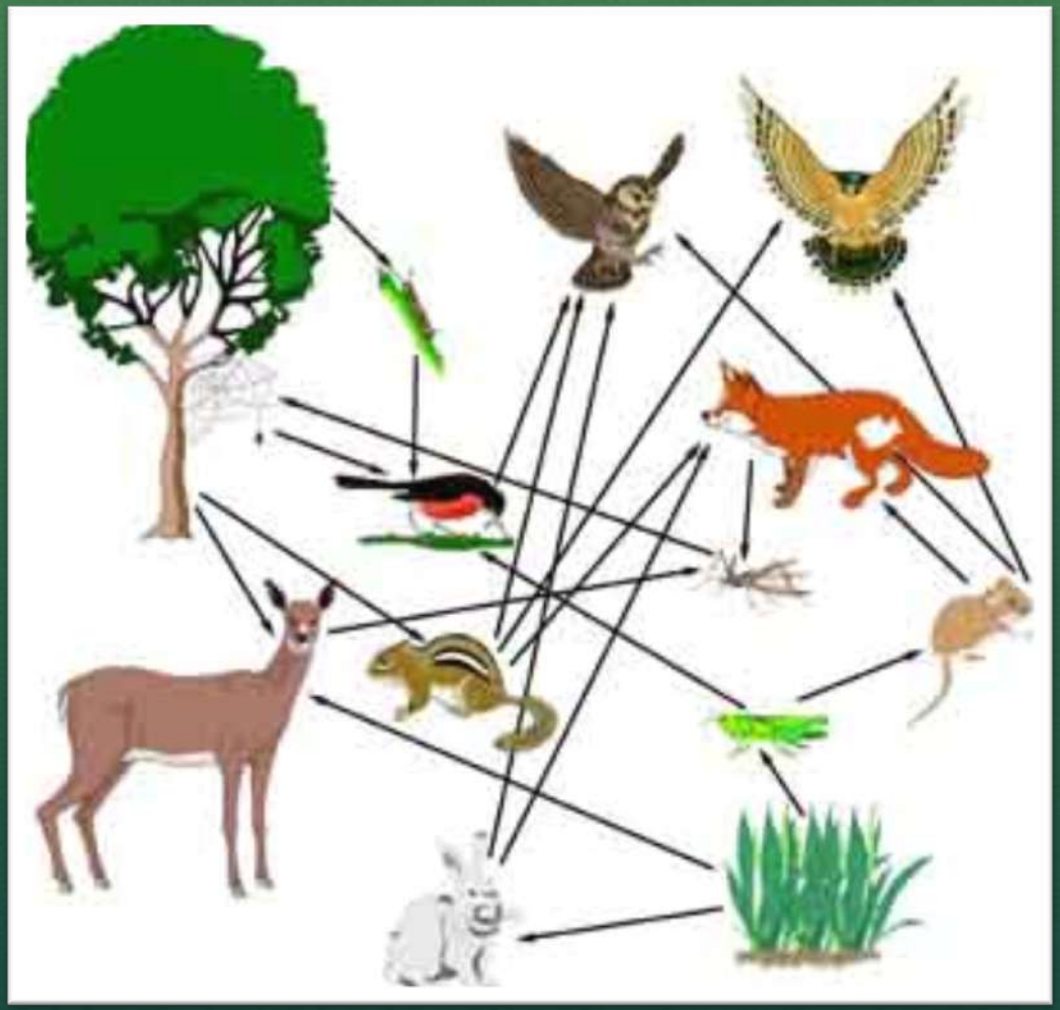
Which one is it?



3.e. Food Webs

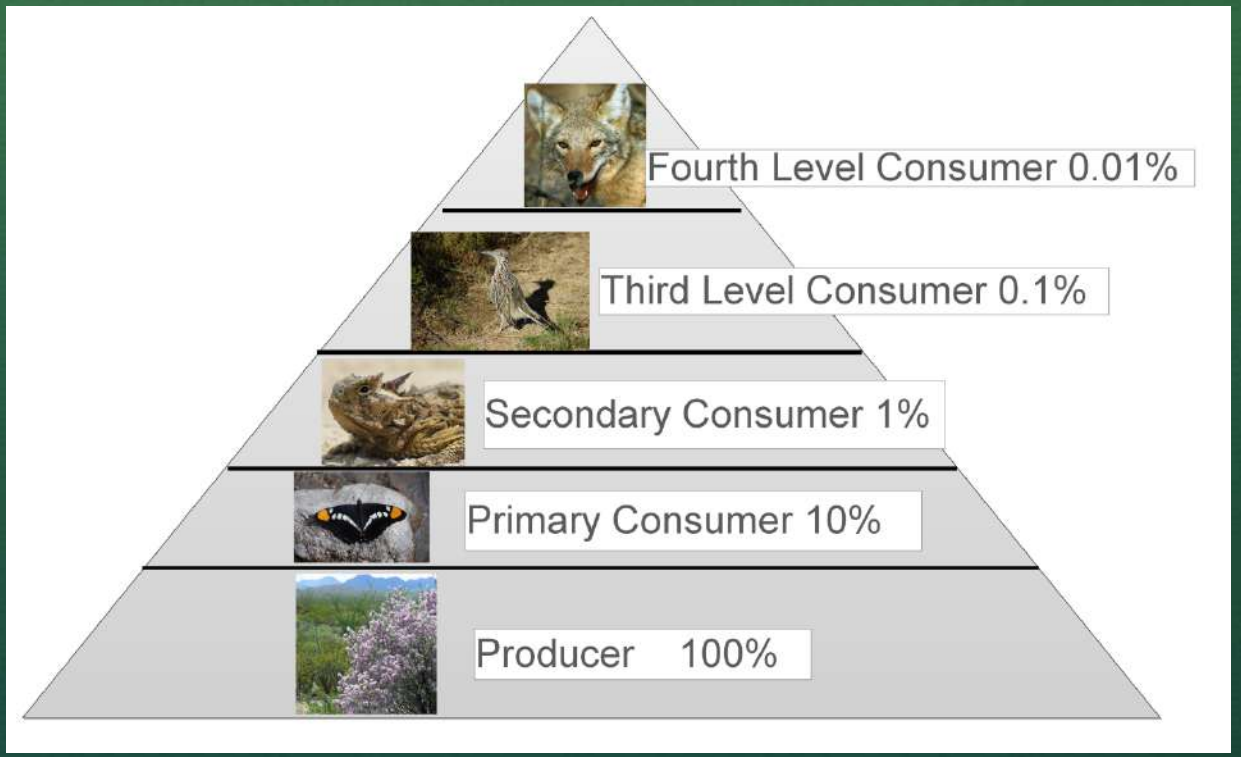
- Population- same species
- Community- different species
- Niche- an organism's role
- In food webs:
  - More food = population increases
  - Fewer prey = fewer predators
  - Arrows show the flow of energy

3.e. Food Webs



3e Energy Pyramid

- Energy Pyramid
  - Only 10% of energy is passed up to the next level



3.f. Selective Breeding

- **Selective breeding-** choosing organisms to mate for best traits
  - Pros: better traits
  - Cons: less diversity, more genetic diseases

3.f. Genetic Engineering

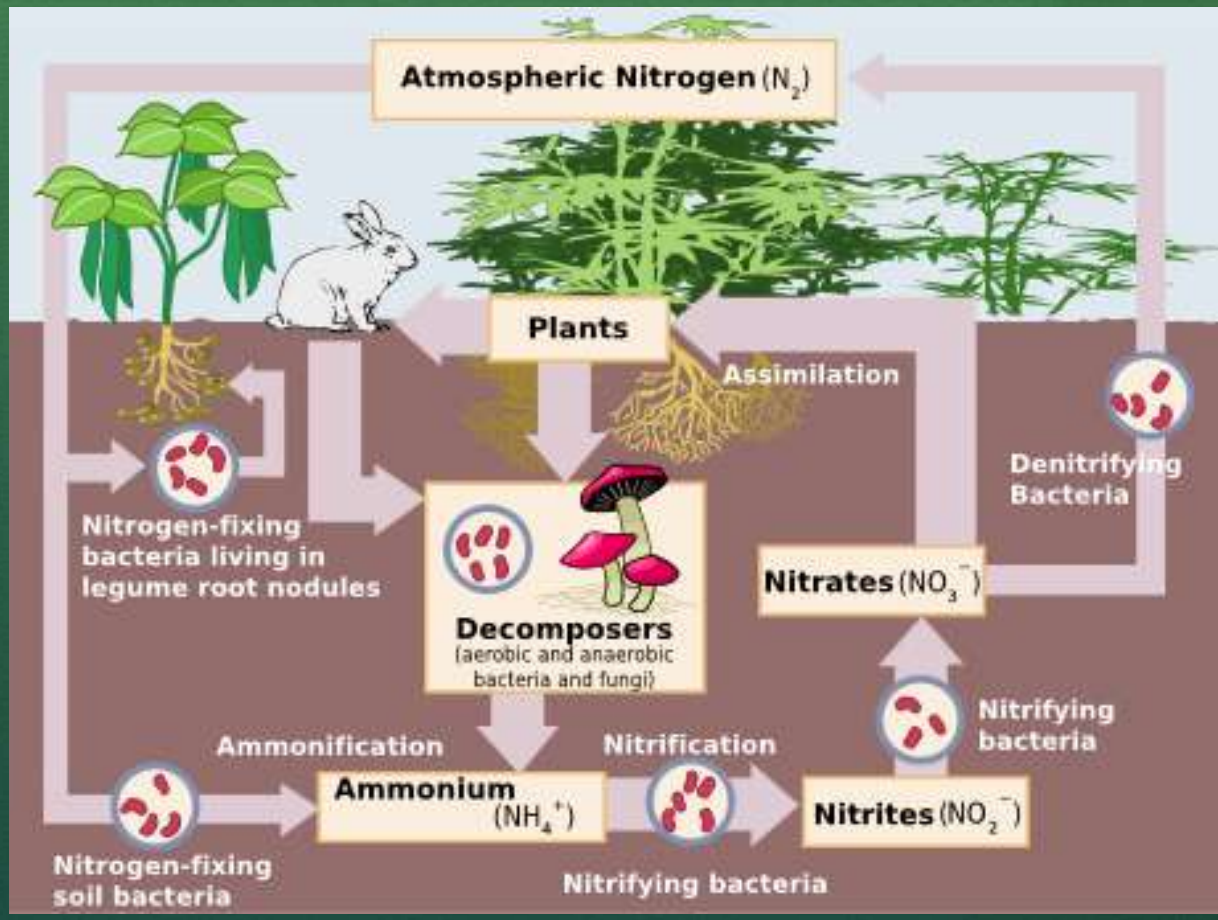
- **Genetic engineering** (gene therapy)- changing genes
  - Pros: disease-resistant crops, more nutritious foods, faster growing
  - Cons: may cause genetic defects, decreases diversity

3.g. Single-celled organisms

- Bacteria- digest food, make yogurt, cheese, can be engineered to produce hormones, can break down oil spills
- Fungi-
  - Yeast- makes bread rise
  - Mold- produce antibiotics, cheese

Nitrogen Cycle

Nitrogen fixing bacteria located on the roots of some plants help convert nitrogen in the air (N_2) to nitrites that plants use for fertilizer & animals use from eating plants



3.h. Respiration

- The process through which ALL cells get energy
- Takes place in mitochondria
- Uses oxygen to get energy from food
- Also called oxidation
- **$C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O + energy$**