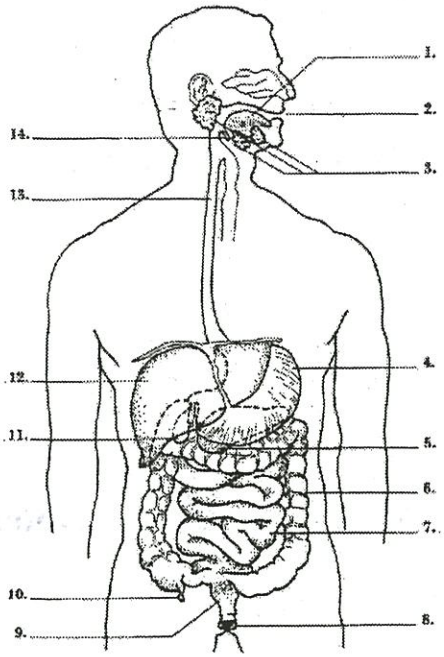
Name: _____ SCTEC3 – Final Review

The Digestive System:



01. Tongue
02. Mouth
03. Salivary glands
04. Stomach
05. Pancreas
06. Large intestine
07. Small intestine
08. Anus
09. Rectum
10. Appendix
11. Gallbladder
12. Liver
13. Esophagus
14. Epiglottis

What path does food take through the digestive system?

The digestive tract (mouth → esophagus → stomach → S.I → L.I. → anus

Salivary glands are located in the mouth, and secrete saliva (amylase) which breaks down carbohydrates.

Gastric glands are located in the stomach, and secrete gastric acid (protease) which breaks down proteins.

~~Intestinal~~ glands are located in the _____, and secrete _____, which breaks down _____.

The pancreas secretes pancreatic juices into the small intestine, which breaks down carbohydrates, proteins, and fats.

The liver secretes bile into the small intestine, which ~~breaks down~~ emulsifies fats.

What is mechanical digestion?

A physical transformation (no new substance created)

Which body parts carry out mechanical digestion?

Mouth (teeth chewing food to make it smaller and expose more surface area)

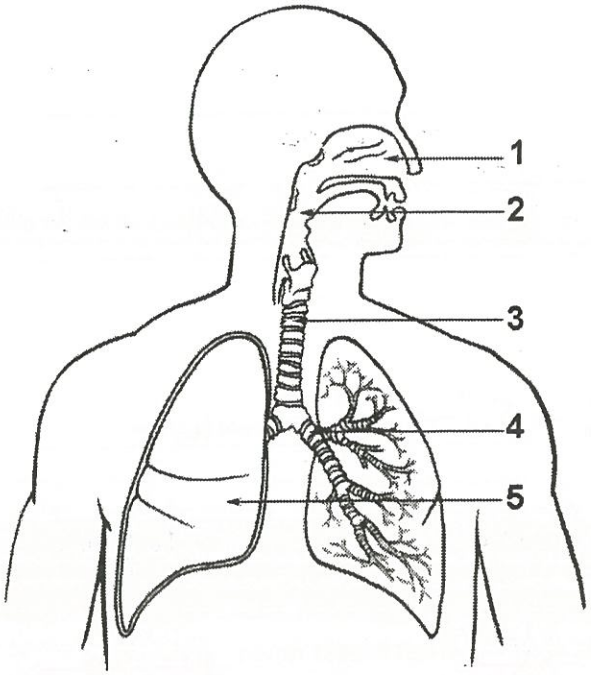
What is chemical digestion?

A chemical transformation (new substance created)

Which body parts carry out chemical digestion?

Several. Examples: Saliva breaking down carbs, protease (proteins) breaking down

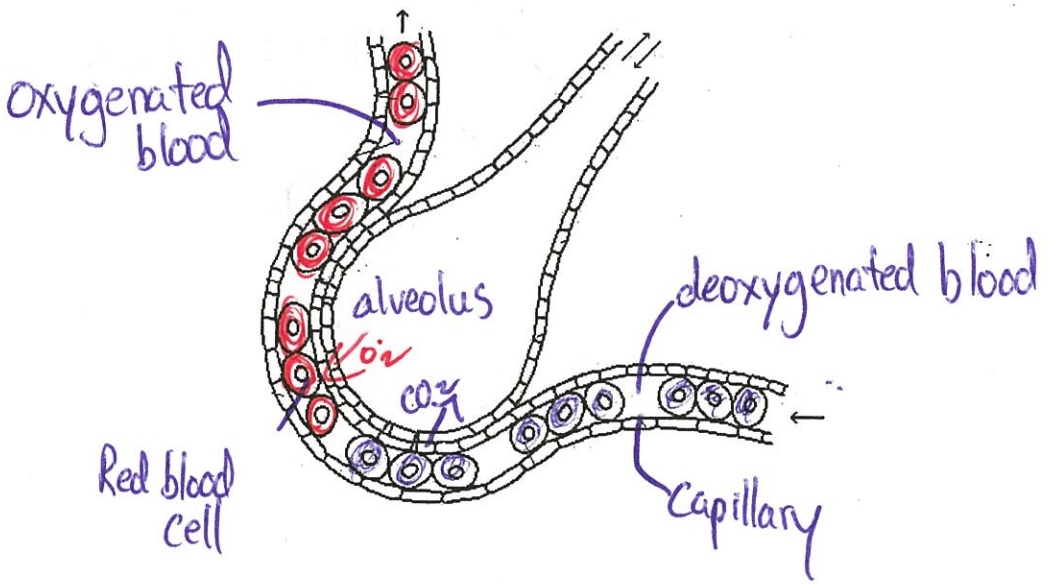
The Respiratory System:



01. Nasal cavity
02. Pharynx
03. Trachea
04. Bronchi
05. Lung
06. What path does air follow through the respiratory tract?

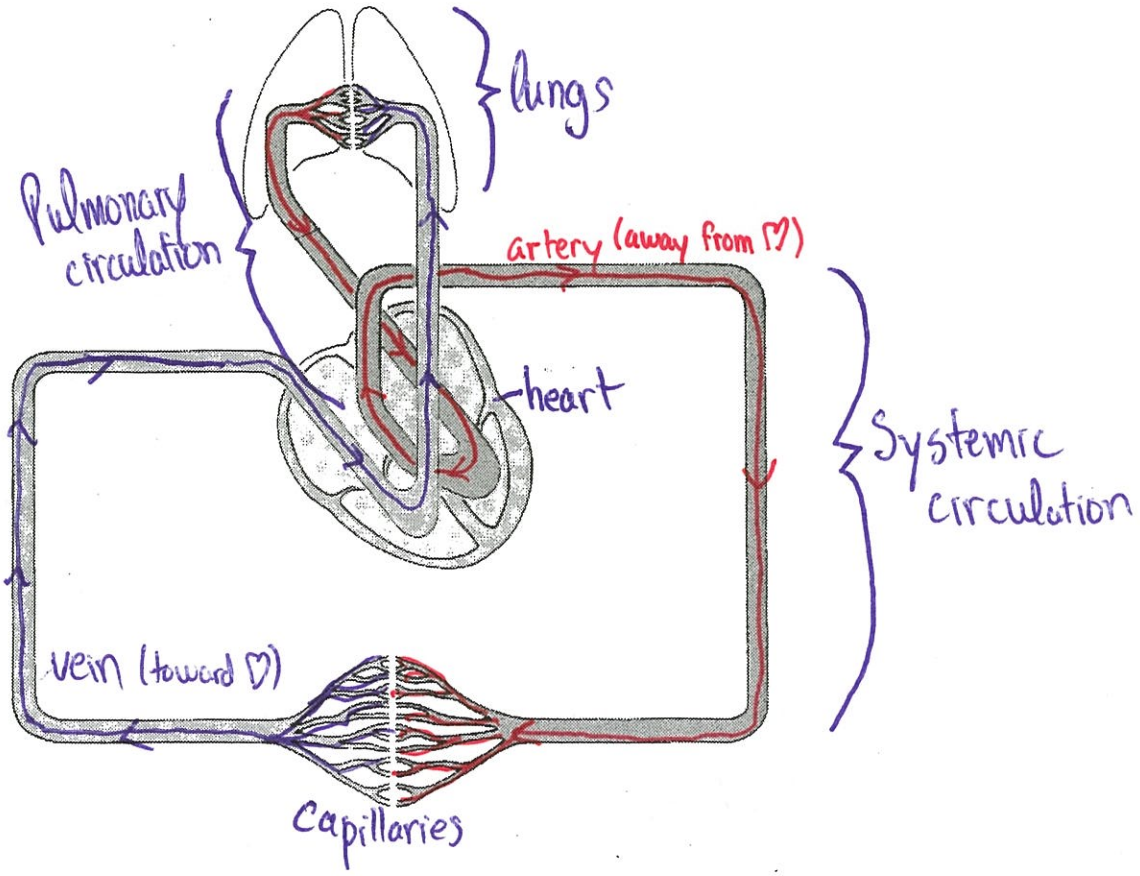
01 → 02 → 03 → 04 → bronchiole → alveoli → blood stream

- Label the diagram of an alveolus below with the following labels: capillary, alveolus, deoxygenated blood, oxygenated blood, red blood cell. Also, draw arrows representing the movement of oxygen and carbon dioxide molecules.

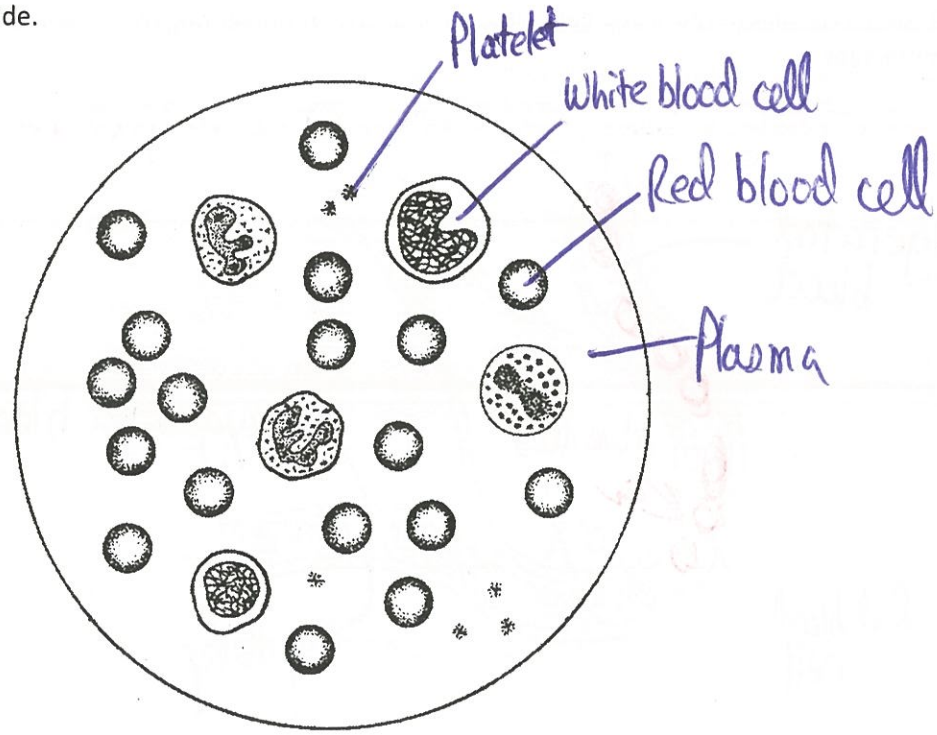


Circulatory System:

Label the following in the diagram below: heart, artery, vein, capillary bed, pulmonary circulation, systemic circulation, lungs. Also, draw arrows showing blood circulation through the heart and body, and indicate where all other organ systems would be found in the diagram.



Label the following in the diagram below: red blood cell, white blood cell, platelet, plasma. Color each as they would appear on a stained microscope slide.

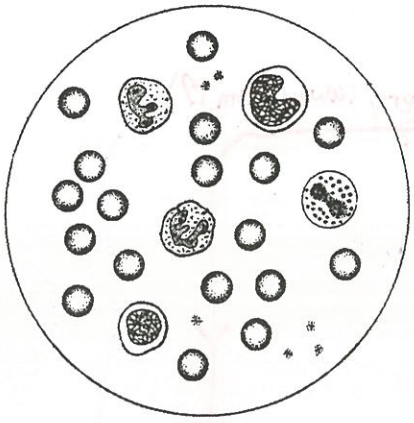


If a person has a A- blood type, what blood types can they accept transfusions from?

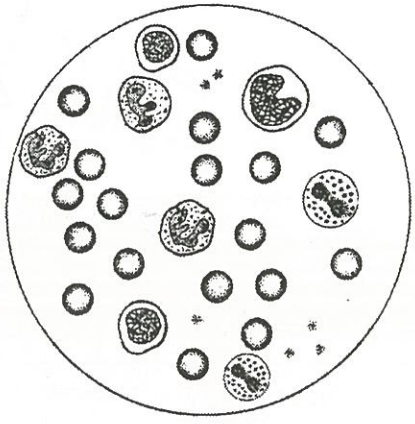
A⁻ and O⁻ only.

Immunity:

Which of the following blood samples is probably fighting off an infection? Explain your reasoning.



Sample A



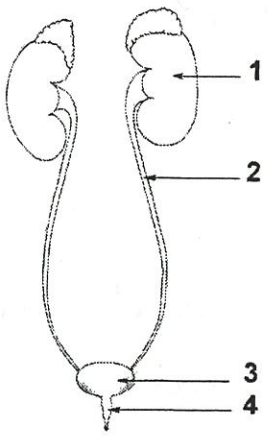
Sample B

Sample B because there are a lot more White blood cells

Excretory System:

What are three ways in which the body gets rid of waste products?

Sweating, respiration, digestion, urination, etc

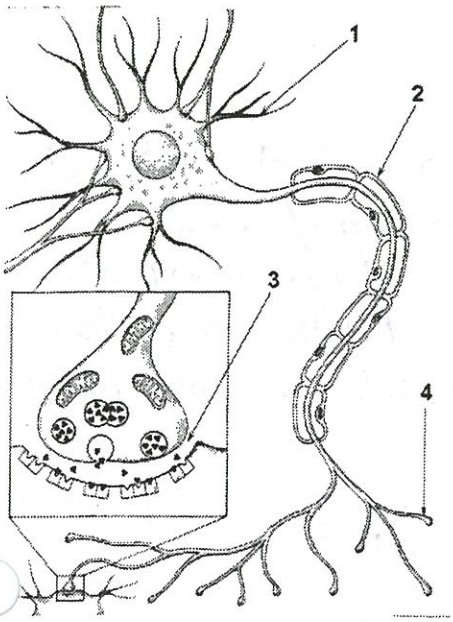


Name the parts in the diagram to the left and give the function for each.

1. Kidney: filters blood and produces urine
2. Ureter: transports urine to bladder
3. Bladder: Storage of urine
4. Urethra: Releases urine

What is urine made up of? Urea, dissolved ions... but mostly water

The Nervous System:



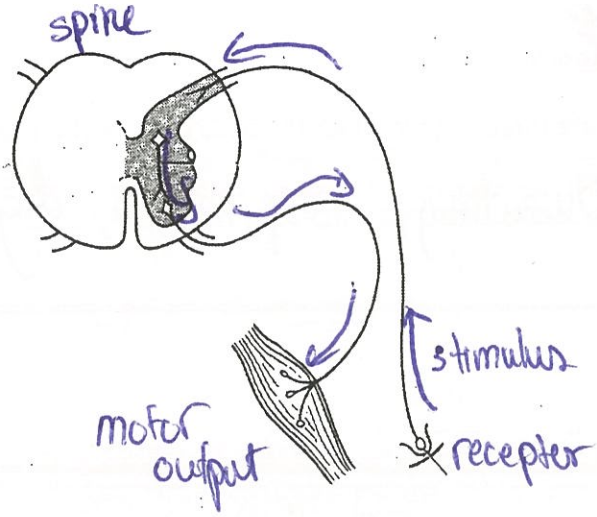
The diagram to the left represents a neuron

Name the parts and give their functions:

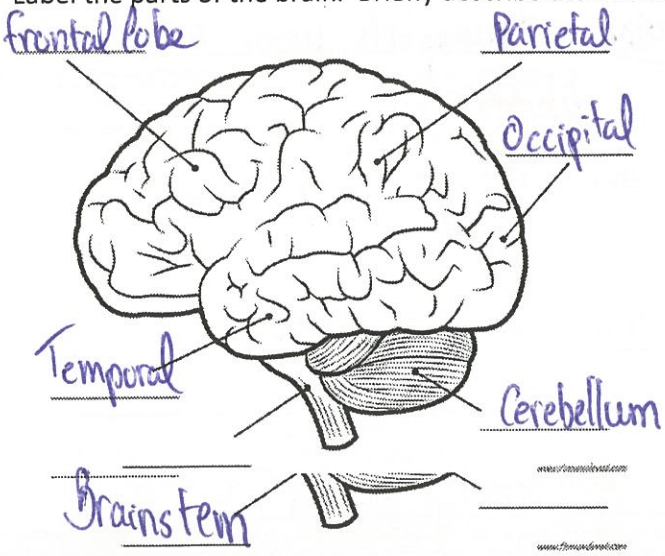
1. Dendrite: communication with adjacent neuron by neurotransmitter
2. Axon (or Myelin sheath): transmits electronic signal
3. Synapse: Small gap between axon terminal and dendrite
4. Axon terminal: Communication with adjacent neuron

Use the diagram to the right to explain how reflexes work. Be sure to draw arrows on the diagram indicating the direction of the nerve impluses.

A stimulus is picked up by a sensory nerve, which transmits its message to the Central Nervous System in the spine (skipping the brain). A quick motor response moves the muscle.

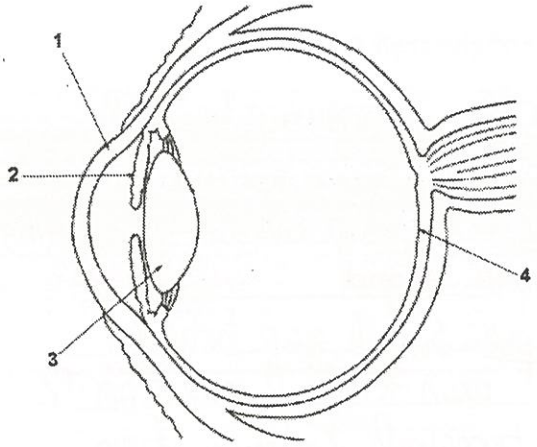


Label the parts of the brain. Briefly describe the functions of each part.



Structure	Function
frontal lobe	Speech, planning, emotion
parietal lobe	touch, pain, taste
occipital lobe	vision
temporal lobe	hearing, memory
Cerebellum	Balance, multitasking
Brainstem	Internal stimuli and critical involuntary movements

The Senses:

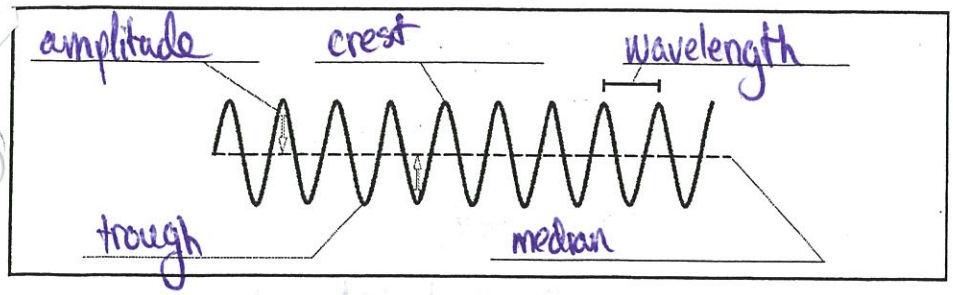


Name the parts of the eye and give their functions:

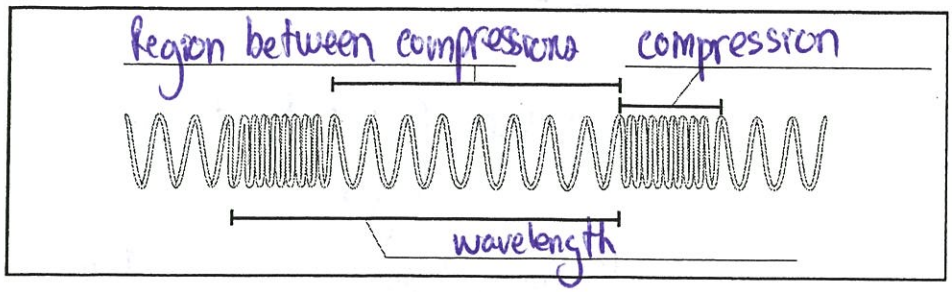
1. Cornea: external, transparent "window" at front of eye (an extension of sclera)
2. Iris: coloured part of eye, it expands and contracts to control the size of the pupil.
3. Lens: Refracts light onto the retina, producing an image
4. Retina: Back of the eye. It has photoreceptors to interpret the image

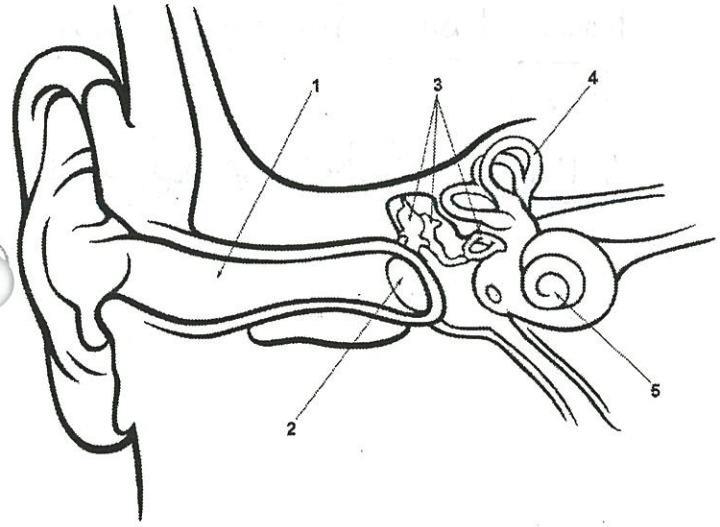
Are images that form on the retina right side up or upside down? Explain.

Upside-down. The light rays cross as they refract (the lens is convex)



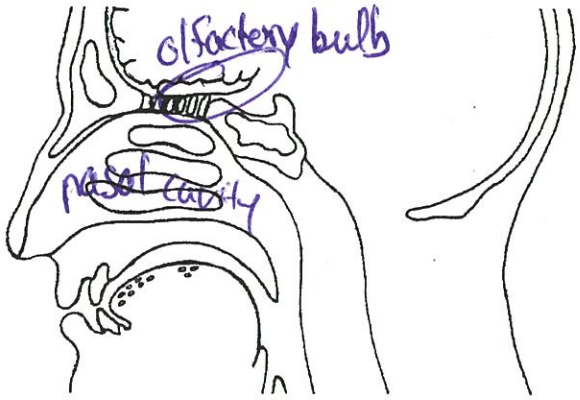
1. Label the parts of each wave.
2. Give each type of wave a title.
3. Which type of wave corresponds to the transmission of light transverse and which corresponds to the transmission of sound? longitudinal





Name the parts of the ear in the diagram to the left and give the function of each.

1. Auditory canal: lined with wax to keep unwanted stuff out
2. Eardrum: Vibrates with sound
3. Ossicles Small bones that move with eardrum
4. Semi-circular canals: balance
5. Where is 5??
6. Cochlea: Resonates to interpret sound

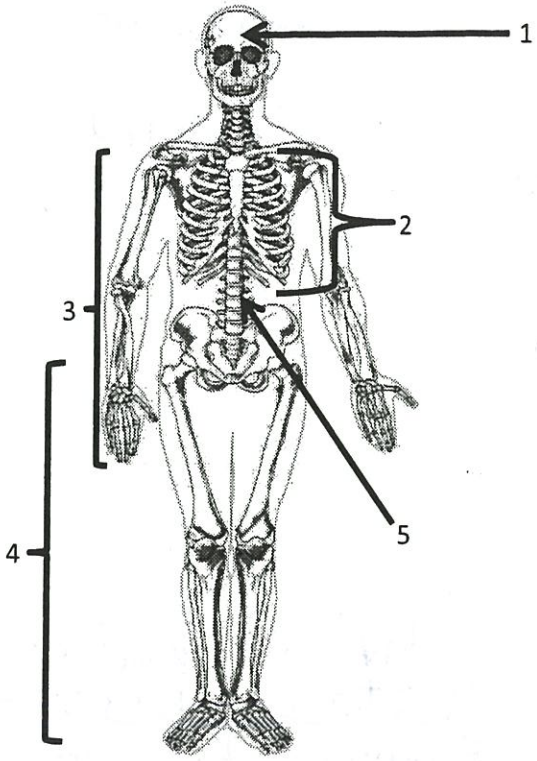


Identify the nasal cavity and the olfactory bulb in the image to the left and describe how they function in olfaction.

Small particles of a substance rise up through the nasal cavity and reaches the olfactory epithelium where they reach specific receptors, sending a message to the olfactory bulb.

The Musculoskeletal System:

What is the role of the musculoskeletal system?



Name each of the main parts of the skeleton to the left and give the function of each.

1. Cranium: Protects brain
2. Rib cage: Protects heart and lungs
3. Radius, ulna, humerus: arm (long bones)
4. Femur, tibia, fibula: leg (long bones)
5. Vertebrae: Protects spinal cord

What are antagonistic pairs of muscles, and how do they work?

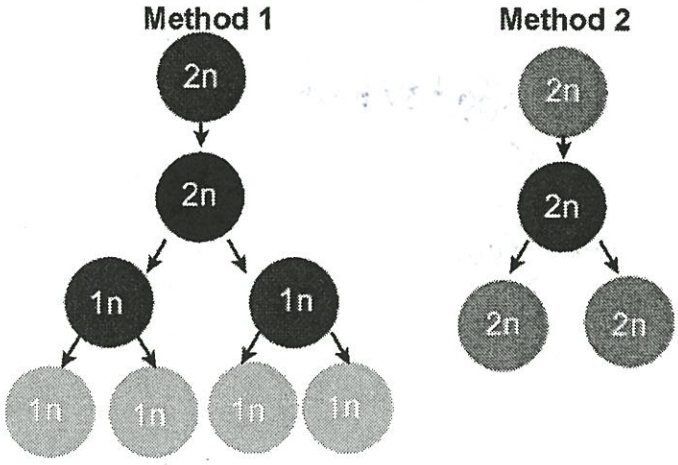
Ex: biceps and triceps. When one expands, the other contracts, which moves bones.

The Reproductive System

Examine the diagram to the right. Which method represents mitosis and which is meiosis. Explain your answers.

Mitosis is Method 2

because The daughter cells are genetically identical (same number of chromosomes) as the parent cell



Nutrition:

Nutrition Facts

Oranges Raw Navels 0.49 cal/g
Serving Size 165g

Calories 81	
	% Daily Value*
Total Fat 0.25g 0.0015	0%
Saturated Fat 0.028g	0%
Cholesterol 0mg	0%
Sodium 2mg	0%
Total Carbohydrate 20.7g 0.13	7%
Dietary Fiber 3.6g 0.022	14%
Sugar 14g	~
Protein 1.5g	~
Vitamin A 8% • Vitamin C	163%
Calcium 7% • Iron	1%

*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.

Nutrition Facts

Apples Raw With Skin 0.52 cal/g
Serving Size 109g

Calories 57	
	% Daily Value*
Total Fat 0.19g 0.0017	0%
Saturated Fat 0.031g	0%
Cholesterol 0mg	0%
Sodium 1mg	0%
Total Carbohydrate 15.1g 0.14	5%
Dietary Fiber 2.6g 0.024	10%
Sugar 11.3g	~
Protein 0.3g	~
Vitamin A 1% • Vitamin C	8%
Calcium 1% • Iron	1%

*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.

Nutrition Facts

Bananas Raw 0.89 cal/g
Serving Size 150g

Calories 134	
	% Daily Value*
Total Fat 0.5g 0.003	1%
Saturated Fat 0.168g	1%
Cholesterol 0mg	0%
Sodium 2mg	0%
Total Carbohydrate 34.3g 0.23	11%
Dietary Fiber 3.9g 0.026	16%
Sugar 18.3g	~
Protein 1.6g	~
Vitamin A 2% • Vitamin C	22%
Calcium 1% • Iron	2%

*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.

If you were watching how many calories you were eating, which of the fruits above would you select (*Justify with calculations)*?

Orange: $\frac{81 \text{ cal}}{165 \text{ g}} = 0.49 \text{ cal per g}$ (lowest amount of calories per serving)

Which of the above fruits would you select if you wanted the least amount of fat (*Justify with calculations)*?

Orange: $\frac{0.25 \text{g fat}}{165 \text{ g}} = 0.0015 \text{ g of fat per g}$ (smallest)

Which of the above fruits has the least amount of carbohydrates (*Justify with calculations)*?

Orange: $\frac{20.7 \text{g carbs}}{165 \text{ g}} = 0.13 \text{ g of carbs per g}$

Which of the above fruits has the least amount of fibre (*Justify with calculations)*?

Orange $\frac{3.9 \text{g}}{165 \text{ g}} = 0.026$

If you wanted to maximize your intake of vitamin A, C, and calcium, which fruit would you select (*Justify with calculations)*?

Orange

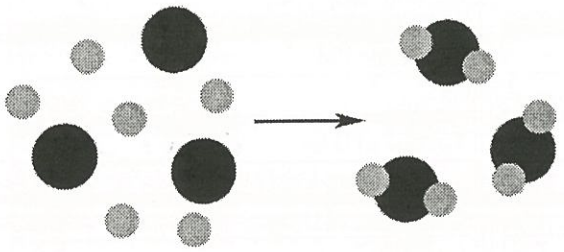
Which of the fruits above has the most sugar (*Justify with calculations)*?

Banana (18.3 g)

Which fruit has the least sodium (*Justify with calculations)*?

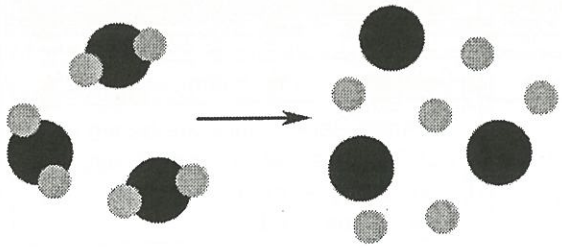
Apple

The Material World:



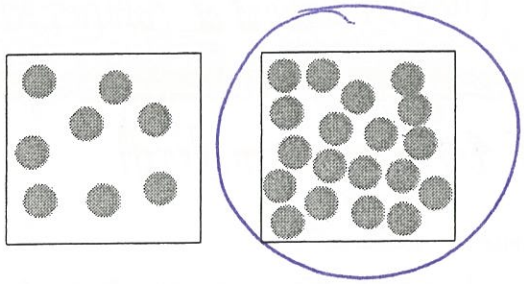
The particle model to the left is an example of a Synthesis reaction. This means that: atoms have formed a more complex molecule

Examples of this reaction in the human body include: N/A



The particle model to the left is an example of a decomposition reaction. This means that: Molecules have broken down into simpler forms

Examples of this reaction in the human body include: cellular respiration (breaking apart glucose)



Assume that the particles in the model to the left represent gas molecules. Which of the containers would be under greater pressure? Explain.

More particles in a smaller area, so there will be more collisions

Assume the above particles represent a gas. Is this a compressible or incompressible fluid?

Compressible

Someone is trying to sell you a chunk of what appears to be gold. Being knowledgeable about minerals, you know that sometimes people mistake pyrite (fool's gold) for gold. Gold has a density of 19.3 g/ml while pyrite has a density of 5.01 g/ml. You conduct a test and determine that the object you have been shown has a mass of 9.65 kg and displaces 0.5 L of water. Is the material actually gold?

$m = 9.65\ kg = 9650\ g$ $\quad D = \frac{m}{V} = \frac{9650\ g}{500\ mL} = 19.3\ g/mL$

$V = 0.5\ L = 500\ mL$

$=$ gold!

You are given 25 g of salt and some water, and are told to make a solution.

- What would your solvent be? water
- What would your solute be? salt
- How much solvent would you need to make a solution with a concentration of 10 g/L?

$C = \frac{m}{V} \rightarrow \frac{10\ g/L}{1} = \frac{25\ g}{V}$ $\quad V = \frac{25\ g \times 1}{10\ g/L} = 2.5\ L$

This process is called: dissolution

- Once you have your solution of 10 g/L, you realize that you made a mistake, and actually needed a solution that was 2 g/L. How much water would you have to add?

$C_1V_1 = C_2V_2$

$(10\ g/L)(2.5\ L) = (2\ g/L)(V_2)$

$25 = 2V_2$ $\quad V_2 = 12.5\ L$

$V_2 - V_1 = \boxed{10\ L}$ must be added

This process is called: dilution

Which parts of the human body are specially designed to pick up waves? What type of waves can they pick up?

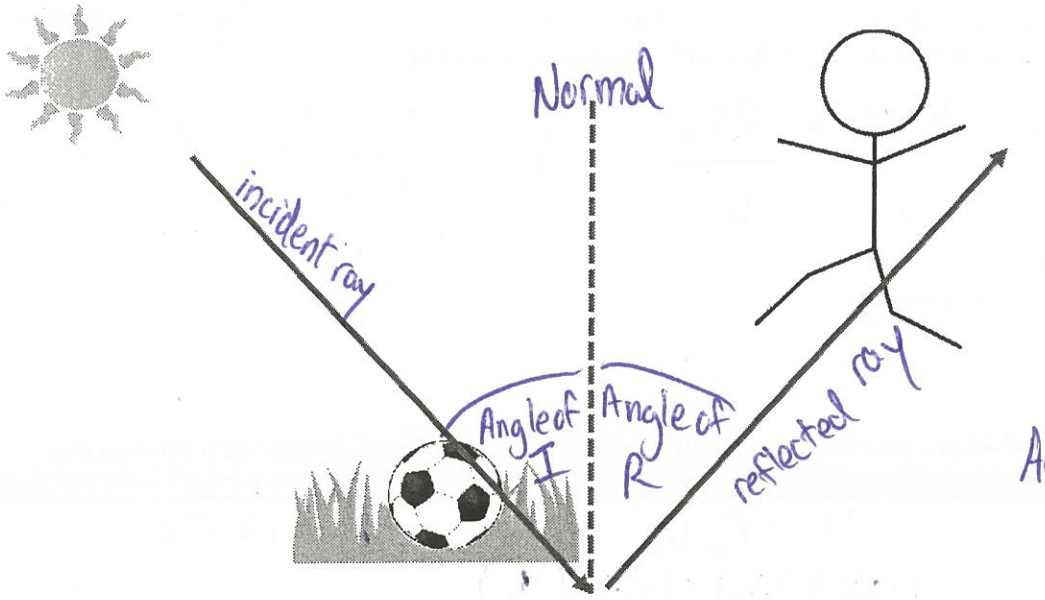
Ear picks up sound waves (longitudinal, mechanical)

Eyes pick up light waves (transverse, electromagnetic)

When considering electromagnetic waves in the visible spectrum, explain:

- Reflection: Light bouncing off objects
- Refraction: Light bending as it enters a new medium
- When light passes through the lens of the eye and bends, this is an example of: refraction
- When looking at an object, you can see it because light is: reflection

Label the following diagram: Incident ray, reflected ray, angle of incidence, angle of reflection, normal

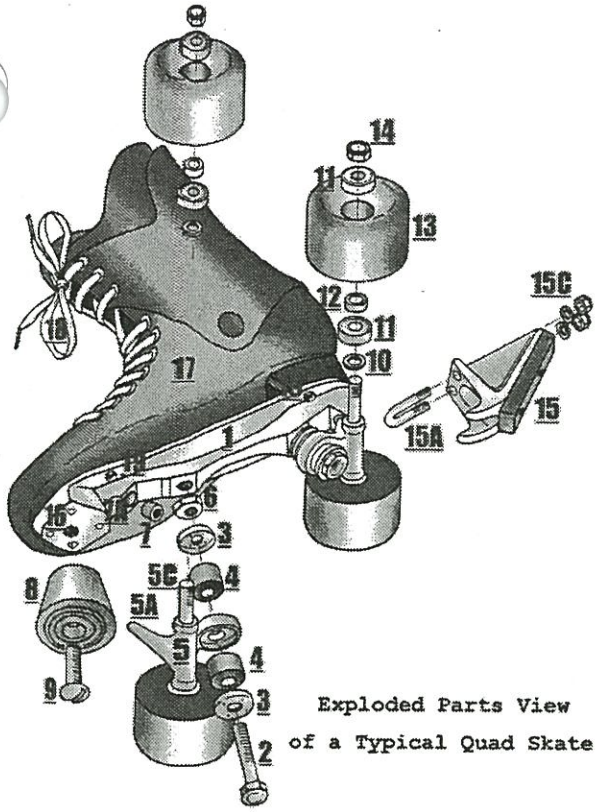


Angle of I = Angle of R

The Hulk and Superman were trying to figure out who was the strongest hero. They decided to have a tug of war contest with a twine rope.

1. What type of mechanical constraint is being applied to the rope? tension
2. After 30 seconds, the rope snapped into two. What type of deformation occurred? fracture
3. The super heroes decided to call Harry Potter to fix the rope. Harry used the *Reparo* spell to fix the rope. However, Harry improved the rope, turning it into carbon fibre. The Hulk and Superman continued their contest, but the rope didn't break or change shape. What mechanical property did Harry add to the new and improved rope? resilience

Describe the 4 characteristics of the following links.



Exploded Parts View of a Typical Quad Skate

Link	Complete or Partial	Rigid or Flexible	Removable or Nonremovable	Direct or Indirect
19 – screw connecting baseplate to boot	C	R	NR	I
18 – shoelace holding sides of boot together	P	F	R	I
16 – rivet holding brakeplate to boot.	C	R	R	I

Last year in science you placed elodea plants under lights and collected the oxygen gas that the plants produced under different conditions. One of the questions you answered was "How does the rate of photosynthesis change with the amount of carbon dioxide gas present?"

The data collected using gas collection equipment looks like this.

	Amount of CO_2 present (in ppm)	Amount of O_2 collected (in mL/H)	Variable
A	0	0.0	Control
B	50	5.4	Control
	100	11.2	Experimental
	150	17.2	Experimental
	200	23.4	Experimental
	250	26.1	Experimental
	300	26.1	Experimental

Which test situation represent the negative control A and positive control B? Why should an experiment test these controls as well as the experimental situations?

To have 2 extremes for data