

Review Questions for June Exam

Term 1

Topic 1 – Cells and Genetics

1. A cell with 20 chromosomes undergoes mitosis. How many daughter cells are created? **2**
Each daughter cell has **20** chromosomes.

2. What are the functions of cell division? **Growth and repair, sexual reproduction**

3. What is genetic diversity? **All possible (total) genetic combinations/variations of a species**

4. GMO's are a result of:

A) Mixing of the races	C) Altering the genetic make-up
B) Organ transplants	D) Organisms becoming extinct

5. Why do cells divide?
 1. **growth and repair**
 2. **production of gametes for sexual reproduction**

6. Give 3 differences between the processes of Mitosis and Meiosis.
 - a. **-2 daughter cells, identical/4 daughter cells, new different daughter cell**
 - b. **1 division/creates diploid cells/2 divisions, haploid cells**
 - c. **growth and repair/sexual reproduction**

7. Identify the processes as Meiosis or Mitosis
 - a) Produces identical cells **mitosis**
 - b) Used for sexual reproduction **meiosis**
 - c) Has 2 cell divisions **meiosis**
 - d) Contains 46 chromosomes (human cell) **mitosis**
 - e) Produces gametes **meiosis**
 - f) Produces 4 daughter cells **meiosis**

- g) Contains half the genetic material of parent cell meiosis
 - h) Used for growth and repair of cells and tissues mitosis

Topic 2- Puberty, cycles and Artificial Reproduction

1. Define Puberty: changes that occur usually between 10-14 years of age that prepare the body for reproduction
 2. Give some male and some female changes which occur during puberty.
 - hair growth (underarms, pubic, etc.)
 - genital organs mature
 - psychological changes
 - f-menstrual cycle starts
 - f-breasts/hips develop
 - m-larynx enlarges
 - m-bone density increases
 3. Answer the questions below about the menstrual cycle.
 - a- What is the corpus luteum's function? Prepares the body to receive fertilized ovum
 - b- What is the follicle's function? Surrounds oocyte during meiosis
 - c- What is estrogen's function? Stimulates pituitary gland to secrete FSH and LH
 - d- What is FSH's function? Stimulates development of ovarian follicle
 - e- What is LH's function? Ovulation and ovarian follicle –corpus luteum
 - f- What is progesterone's function? Inhibits FSH and LH
 - g- Why does ovulation occur? Hormonal surge of FSH and LH
 - h- What causes progesterone to be secreted? Release of ovum, ovarian follicle becomes corpus luteum
 - i- What causes the follicle to grow? Pituitary gland secretes FSH
 - j- What causes FSH to be secreted? Corpus luteum disintegrates and progesterone decreases
 - k- What causes the endometrium to develop? Production of estrogen by a new ovarian follicle

- l- Which gland secretes FSH and LH? Pituitary gland
- m- Why does the corpus luteum form? Ovulation, LH and FSH secreted (hormonal surge)
- n- Why does the corpus luteum deteriorate? Non-fertilized ovum
- o- Why does a female get her period? Expulsion of endometrium and unfertilized ovum, progesterone decreases, corpus luteum deteriorates
4. Fill in the table giving a brief explanation of each and when each would be used.

Hormone therapy (ovarian stimulation)	Artificial insemination	In-vitro fertilization	Microinjection
Take the hormones stimulate or activate the ovaries to release 1 or more eggs (women who rarely or never ovulate)	When infertile, artificial insemination is used to inject semen directly into the female's uterus on the day of ovulation. It's mostly used when sperm cannot pass the cervix or sperm count or motility is low	The ovum is fertilized in a lab setting (not in the body) embryos are implanted in the uterus to continue development until birth, they undergo 4 steps; -ovarian stimulation -retrieval -fertilization -transfer used when you want ensured results	Same steps as in-vitro BUT the physician injects the sperm cells directly into the ovum(egg), used when there is low sperm count or fertilization poses a problem

Topic 3- Nutrition, Digestion and Pure Substances

1. What is the function of the digestive system?
 Energy/Repair Breaks down nutrients into smaller/usable forms
 (Transformation of food into nutrients that are absorbed and used by the body)

2. Fill in the table

Nutrients	Functions	Broken down to	Examples of food
Carbohydrates	1 st energy source	Simple glucose	Pasta, rice, toast
Fats	2 nd energy source	3 fatty acids and 1glycerol	Oil, butter
Protein	Repair and regrowth 3 rd energy source	Simple amino acids	Meat, nuts, beans
Vitamins, minerals, Fiber and water	Regulate metabolism		Water, fruit., veg

3. Convert the following foods to kJ, what is the function of that food?

- Chocolate chip cookies:
- 22 g of carbohydrates ($22 \times 17 = 374\text{kJ}$) (1st E source)
 - 3 g of protein ($3 \times 17 = 51\text{kJ}$) (Repair and Regrowth)
 - 9 g of fat ($9 \times 37 = 333\text{kJ}$) (2nd E source)

4. Fill in the table of pure substances.

	Atom	Element	Molecule	Compound
Examples	Na (sodium)	O ₂ (Oxygen)	H ₂ O (any 2 or more elements together)	NaCl (2 or more DIFFERENT elements together)

5. Define a gland and enzyme.

Gland: makes secretions to digest nutrients in certain areas (mouth= carbs, stomach=proteins, intestine=fats, protein 2nd, carbs 2nd)

Enzyme: liquid that is excreted from gland to start digestion/breakdown of nutrient/speeds up reactions (ex: saliva, gastric juices, and intestinal juices)

6. Define a mechanical breakdown and give 2 examples.

-physical change, changes the look but not the makeup. Example: chewing, churning, peristalsis)

7. Define a chemical breakdown and give 2 examples.

-chemical change that alters the molecular breakdown of the substance, irreversible. Ex: saliva breaking down carbs, gastric juices breaking down proteins, intestinal juices breaking down all nutrients)

8. Define peristalsis. Muscle contractions of digestive tract to push contents forward

9. Define absorption

Passage of nutrients from digestive tract into the blood or lymph by diffusion

10. Fill in the table

Passage-Way of digestion	Mouth	Esophagus	Stomach	s. intestine	l. intestine	rectum
Mechanic-al bd. occurring	Chewing/grinding	Peristalsis	Peristalsis Churning Grinding	Peristalsis Churning	Peristalsis	peristalsis

11. Fill in the chart about chemical breakdowns.

Nutrient	Location of 1 st breakdown	Gland	Enzyme	Becomes	Location of 2 nd bd.	Gland	Enzyme
Carbo's	Mouth	salivary	saliva	glucose	Small intestine	Intestinal juices	Simple glucose
Protein	Stomach	gastric	Gastric juices	Amino acids	Small intestine	Intestinal juices	Simple amino acids
Fat	Small intestine	intestinal	Intestinal juices	3 fatty acids and 1 glycerol			

12. What are the 2 organs that play a role in digestion but that food never enters?

Where do their enzymes go when they are secreted?

Pancreas-pancreatic juices

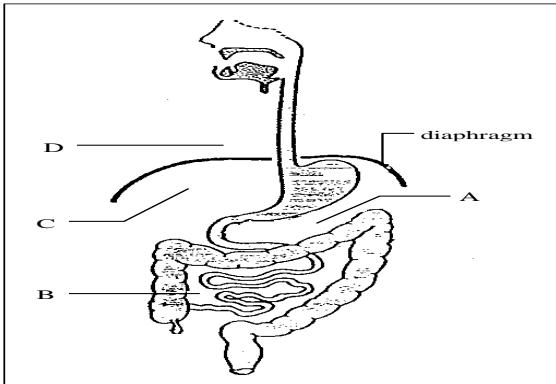
Liver-bile

13. Where does the absorption of simple nutrients occur? Why does it occur there?

Small intestine-because there are folds called villi on the surface of the intestine that increase absorption-villi surrounded by blood vessels.

14. Where does the absorption of water, vitamins and minerals occur? Large intestine

15. Label all the parts not just the letters.



16. Joanne is fifteen and recently broke a bone in her leg. Which nutrient is thus very important for her at this stage in her life?

- A) Carbohydrate
- B) Protein**
- C) Lipid
- D) Water

17. The chart below matches the nutrients that the body requires, with the functions they perform and the foods in which they could be found.

Essential Nutrients	Functions	Food Source
Carbohydrates	Provide energy	1
Lipids	2	Oil and butter
Proteins	Build or repair body tissue	3
Water, mineral salts, vitamins...	4	Fruits and vegetables

Which of the following series correctly completes the chart?

- A) 1- Meat and alternates, 2- Provide energy, 3- Milk products, 4- Regulates metabolism
- B) 1- Breads and sweets, 2- Regulates metabolism, 3- Breads and sweets, 4- Regulates metabolism
- C) 1- Milk products, 2- Provide energy, 3- Meat and alternates, 4- Regulates metabolism
- D) 1- Breads and sweets, 2- Provide energy, 3- Meat and alternates, 4- Regulates metabolism**

18. You are at a grocery store looking for something which will give you a quick energy fix. You read the labels of three different foods, you are able to analyze

them because you have your calculator with you at all times. The table below gives you the information on the labels.

Label information

	Carbohydrates (g)	Protein (g)	Fat (g)	Total energy	function
Food 1	24 *17	2.5 *17	0.5*37	469 kJ	Energy
Food 2	0	19*17	6*37	545 kj	Growth and repair
Food 3	0	0	14*37	518kj	energy

- a- Find the kJ content of each food, include the total kJ
- b- Give the function of each food /6

19. Fill in the table

	Protein	Carbohydrates	Fats
Function	Growth and repair	1 st energy	2 nd energy
Examples of it	Meat and alternatives	grain	Butter/cheese
Number of grams needed per day	2g/kg	500g	75g
What you multiply to get from grams (g) into kJ	17	17	37
The amount of kJ needed per day	34 kj	8500	2775

20. 2. What 4 nutrients are responsible for regulating metabolism?

Water	Minerals	Vitamins	fibre
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21. 3. Calculate the kJ intake of the chips:

$$\begin{array}{l} 20 \text{ g of carbohydrates} \\ \times 17 = 340 \end{array}$$

$$\begin{array}{l} 12 \text{ g of fat} \\ \times 37 = 444 \end{array}$$

$$\begin{array}{l} 2 \text{ g of protein} \\ \times 17 = 34 \end{array}$$

$$\text{Total} = 818\text{kJ}$$

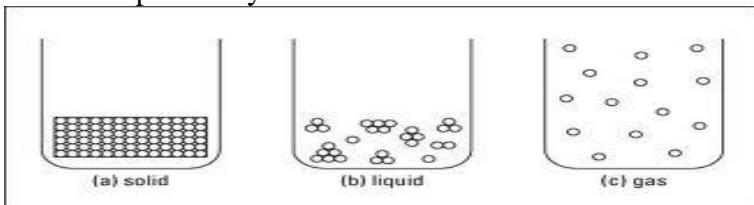
Topic 4- Particle model, properties and chemical reactions

1. Fill in the table below about phase changes.

	Solid to liquid	Liquid to solid	Gas to liquid	Liquid to gas
Phase change	melting	solidification	condensation	evaporation

Temp. ↑ or ↓	up	down	down	Up
Energy ↑ or ↓	up	down	down	Up
↑ or ↓ attraction	down	up	up	down

2. Explain why the 3 states of matter look different.



Bonds in solids are stronger, bonds in liquids are weaker than a solid but stronger than a gas, bonds in gases are weak. Level of attraction is strongest in solids and weakest in gases. Movement of particles greatest in gases and smaller/weakest in solids (liquids are middle). (as temperature increases, there is less attraction between particles because the bonds holding them together break)

3. What is the difference between a characteristic vs a non characteristic property?

Give an example of each.

A characteristic property is a specific property that is unique to one substance.(ex: density) A non-characteristic property is a general property shared by many substances, that can describe more than one substance.(ex: color)

4. Fill in the table below on how to find the density of different substances.

	Regular solid	Irregular solid	Liquid	Unit
Mass	Triple beam balance	Triple beam balance	Liquid + gc - Graduated cylinder = liquid	g
Volume	LxWxH	Water displacement	Graduated cylinder	cm ³ /ml
Density	Mass divided by volume	Mass divided by volume	Mass divided by volume	g/ml or g/cm ³

5. An eraser had a mass of 6g and a volume of 4cm³. What is the density of the eraser?
 $6 \text{ divided by } 4 = 1.5 \text{ g/cm}^3$
6. A paper's length is 3cm, its width is 3.5cm and its height is 2.3cm. Its mass is 4.5g. What is its density?
 $3 \times 3.5 \times 2.3 = 24.15\text{cm}^3$
 $4.5 / 24.15\text{cm}^3 = 0.19 \text{ g/cm}^3$
7. Explain if a rectangular and a cubed piece of iron will have the same density.
 Yes, it is a characteristic property. Any size of iron will have the same density because it is all iron. (the mass and volume equal out based on each shape or piece)

8. Fill in the table of liquids.

	Blue litmus	Red litmus	Cobalt chloride	Conductivity
Distilled water			x	
Salt water			x	x
Alcohol				
Acid	x		x	x
Base		x	x	x

9. What is Cobalt chloride paper used for: detect the presence of water

10. What is the density of water? 1g/ml (pure water)

11. Fill in the gases table

	Oxygen	Carbon dioxide	Hydrogen
Test	Glowing splint	Lime water	Lite splint
Result	Lit splint (fire relights)	Cloudy, precipitate	Popping sound

12. Which tests from question 8 and 11 are characteristic properties?

Density, all 3 gas tests, litmus

paper*****

13. In the laboratory, you perform various tests on a liquid and note the following results:

1. The liquid makes cobalt chloride paper turn pink.
2. The density of the liquid is 1.2 g/mL.
3. The liquid has no effect on either red or blue litmus paper.

Which of the following statements is true?

- A) The liquid is a basic solution
 - B) The liquid is an acidic solution
 - C) The liquid is a mixture of water and something else
 - D) The liquid is pure water

14. Fill in the table below on chemical reactions

Type of reaction	Definition	Mass	Products	Example
Synthesis	Two simple molecules chemically bond to form a complex molecule	Mass increase	compound	$H_2 + O = H_2O$ $Na + Cl = NaCl$
Decomposition	A complex molecule chemically divides into two simple molecules	Mass decrease	element	$HCl \rightarrow H + Cl$

15. The following statements indicate possible reactions that occur during a chemical change. Which of them indicate the substance was originally a compound?

Term 2

Topic 1- Fluids and respiration

1. What is the definition of a fluid?

A substance that has the capacity to flow and fill the form of the container into which it has been poured

2. Which states of matter are fluids? **Liquids and gases**

Why are gases compressible fluids? The space between particles is farther apart so it causes them to move closer together (compress)

3. Why are liquids incompressible fluids? **Because their volume cannot be varied**
spaces between particles cannot be compressed so they will be moved
4. In compressible fluids, collisions depend on which 3 variables? Explain them.

Number of particles

Number of collisions

Volume of fluid

5. What is the passageway air follows to get to the lungs? What is the function of the respiratory system?
Passageway: nasal cavity, pharynx, trachea, bronchi, bronchioles, alveoli, capillaries (gas exchange; undergoes diffusion)

Functional unit: alveoli

Function: uses oxygen as a role to combine with food and turn them into energy

6. What is the functional unit of the lung? **alveoli**
7. What muscle controls respiration? **Diaphragm and intercostal muscles**
8. What controls the lungs getting bigger and smaller? **Muscles relax and contract (change in pressure)**
9. Explain the process which occurs during respiration.

10. **inhalation: muscles contract, ribs rise and diaphragm descends, lung volume increases, pressure inside lungs decreases and is lower than outside so air can flow into lungs.**

Exhalation: muscles relax, rib drop and diaphragm relaxes, lung volume decreases, pressure increases higher than outside so air flows out until pressure is equal.

11. Why does oxygen travel from the lung to the blood then to the cell?
By diffusion so that cellular respiration can occur within the cells.

12. Why does carbon dioxide travel from the cell to the blood then to the lung?

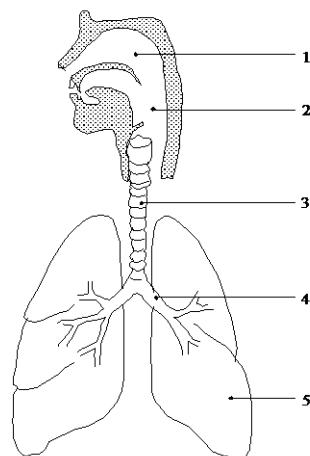
Again by diffusion because carbon dioxide is a waste product that needs to be expelled from the body.

13. Explain what diffusion is. Movement of particles from areas of high to low concentration.

14. Why can diffusion occur? Membrane is semi permeable so some substances can pass through.

15. Which type of blood vessel allows for diffusion? capillaries

16. Label all the parts not just 1 to 5.



Topic 2- Blood components, types, circulatory system, lymphatic system

1. What are the function(s) of the following?

RBC	WBC	Platelets	Plasma
To transport oxygen and carbon dioxide with the help of a protein called the hemoglobin	Produces antibodies to protect against antigens	Helps the blood clotting process and prevents excessive bleeding	Transports; nutrients to cells, waste products to excretory organs, hormones, antibodies, proteins etc.

			(transportation system)
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2. Explain the purpose of a vaccination and how it works.

- Two types
- Inactive and live
- Live; chemically treated to remove ability to cause illness, infectious agent is still alive but has no ability to cause disease
- Inactive; made using part of infectious agent (antigen)
- The cells are treated to render them harmless

3. What is the function of antibodies?

Neutralize specific antigens that can be harmful to the body or recognize and destroy antigens (phagocytosis)

4. What are the 2 ways someone will acquire immunity?

- 1) Getting the vaccine
- 2) Getting the sickness

5. Explain how blood donation and receiving works.

A donor gives blood, a recipient receive blood through a transfusion.

6. Can O- donate to B+, why?

Yes because o- has no antigens and contains no rh factor

7. Can B+ donate to O-, why?

No because b+ contains the rh factor and agglutinogen-B (antigen) which o- does not contain

8. Why is O- the universal donor?

Because it has no antigens

9. Why is AB+ the universal recipient?

Because it has all of the antigens and therefore does not need any antibodies

	A+	B+	AB+	O+	A-	B-	AB-	O-
Donate	A+,AB+	AB+, B+	AB+	O+, AB+, B+, A+	A-, AB-, B+, A+	B-, AB-, AB+, B+	AB+, AB-	ALL
Receive	O-, A+, O+, A-	O-, B-, B+	O-, AB+, B+, A-, B-	O-, O+	O-, A-	O-, B-	O-, AB-, A-	O-

10. During a blood typing lab, how can we determine what our blood type is?

By seeing what types agglutinate with other types of blood. OR The Anti – agglutine will show the reaction of blood type.

11. Which minor and major blood vessels carry arterial blood?

Arteries, carry Red/Oxygenated blood away from the heart to the body, pulmonary vein

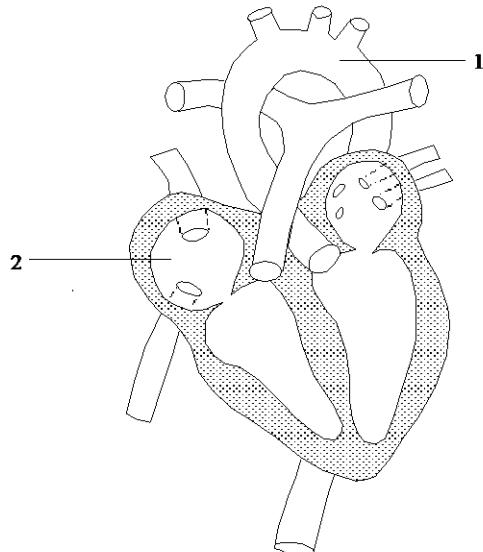
12. Which minor and major blood vessels carry venous blood?

Veins, inferior and superior vena cava, pulmonary artery

13. What type of blood do capillaries have and why do they have it?

Oxygenated blood to diffuse it to body cells.

14. Label all the blood vessels and the chambers of the heart, not just numbers 1 and 2.



15. What is the function of the systemic circulation and what does it start and end with?

Starts at left ventricle, has oxygenated blood which leaves heart through the aorta to be sent to the body to give body oxygen and collect carbon dioxide, ends at the right atrium

16. What is the function of the pulmonic circulation and what does it start and end with?

Starts at the right ventricle, has deoxygenated blood which is sent to the lungs to get rid of carbon dioxide and get oxygen, ends at left atrium.

What is the function of the lymphatic system and lymph? Works with the circulatory system, returns waste to blood and the excretory organs

Lymph is the fluid carried doing the destroying (filled with white blood cells)

17.

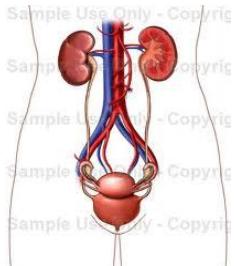
Term 3

Topic 1- Urinary system and dilutions.

1. What is the function of the urinary system?

To eliminate waste from the blood with the help of the kidney, ureters, bladder, urethra.

2. On the diagram below, label the kidney, ureter, bladder and urethra and give the functions of each.



3. What is the function of the nephrons?

To filter the blood

4. What are urea and uric acid and how are they produced and eliminated?

Protein waste, eliminated through the waste system (kidneys, ureters, bladder, urethra)

5. Once blood enters the kidneys, what are the 2 passageways the substances can take?

Renal vein back to heart (CO_2 , purified blood)

Ureters carry urine to the bladder for elimination

6. Fill in the table.

Must be eliminated	Could be eliminated or kept	Should not be eliminated
Urea, Uric Acid	Water, minerals, vitamins	Blood, protein, carbs, fats

7. Give a situation where a person will have high absorption and low urination.

When you eat a lot of salt (popcorn, chips, fries with added salt) or working out and drinking water

8. Give a situation where a person will have low absorption and high urination.

When you eat a lot of fruits

9. Explain what a dilution is.

Decreasing the concentration of a solution by adding solvent

10. You have 500 ml of a 14 g/L solution. You want to have 900 ml of the solution.

What is the concentration of the diluted solution?

7.78 g/ml

11. You have 4L of a 22 g/L solution. You want to have 300 ml of the solution. What is the concentration of the diluted solution?

- Just remove 300 ml of the solution from the original.

12. Explain what solubility is and what factor can increase solubility.

Nature of the solute (Koolaid vs sand)

Temperature of the solvent (hot water vs cold water for hot chocolate)

13. You have 200 ml of a 10 g/L solution. You want to dilute it to 3 g/L. Give a procedure you would use to make the dilution.

$666.67 \text{ /ml} \cdot 200 \text{ ml} = 466.67 \text{ ml}$

- 1) pour 200 ml of 10g/l solution in a 1l flask
- 2) measure 466.67 ml of water using a graduated cylinder
- 3) add this to flask and mix

14. You have 800 mL of a 16% solution. You want to dilute it to a 2% solution. What is the volume of the diluted solution?

6.4L

Topic 2- Nervous system

1. What is the function of the brain? Send and receive message to and from the body. Controls voluntary and involuntary movement, interprets messages from the senses, controls intelligence and emotions, regulates physiological functions, reflexes, transport nerve impulses.

1. The basic function of the nervous system includes

- a. Signals, Synapses, Muscle Contractions
- b. Sensory Output, Integration, Motor Input

- c. Neurons, Parasympathetic response, Motor output
- d. Sensory Input, Integration, Motor Output

Explain how a reflex works. Sent from the spinal cord, skipping the brain initially, causing a reaction and message to react to stimuli. Brain is informed after but message comes from spine.

2.

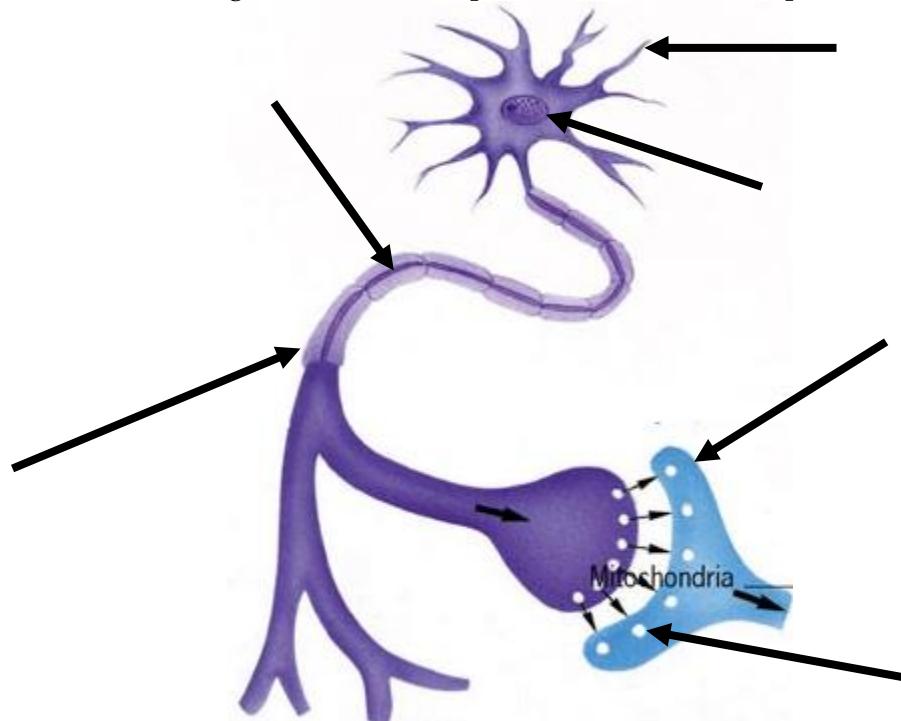
3. What connects the brain to the spinal cord and what is its role? **Medulla oblongata** (brain stem) automatic functions (breathing, heart beat, digestion)

4. What is the difference between a sensory neuron and a motor neuron?
Sensory neuron receives nerve impulse and transports it to integrating center. Motor neuron brings impulse to muscle to move

5. Which are parts of the neuron?

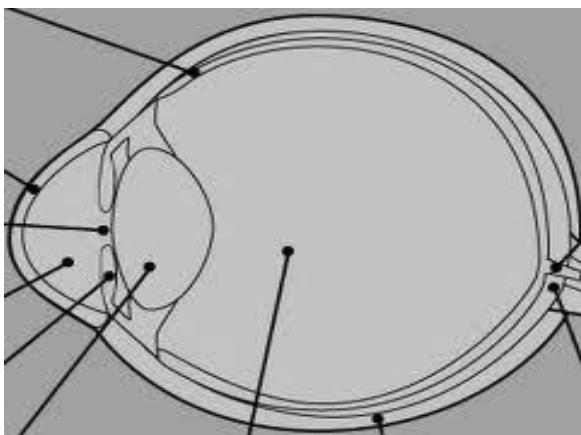
- a. Brain, brain stem, dendrites, myelin sheath
- b. Dendrite, axon, cell body
- c. Brain, dendrite, synapse, myelin sheath
- d. **Dendrite, axon, cell body, nucleus**

6. Label the following nerve cell and explain what the different parts do:



Topic 3 – Senses and Waves

- Label all the parts of the eye diagram disgusted in your notes and give their function.



- Explain what myopia is, why we see blurry when myopia occurs, the type of lens to use and why it solves the problem.

Nearsightedness, image appears before the retina. Diverging lens, biconcave.
Allows the light rays to diverge and hit the retina at the right, extended spot.

- Explain what hyperopia is, why we see blurry when hyperopia occurs, the type of lens to use and why it solves the problem.

Farsightedness, image appears after the retina. Converging lens, convex.
Allows the light rays to converge, come together earlier and land on the right spot of the retina.

- Label the trough, crest, amplitude and wavelength on the diagram, below.

- On the line below, re-draw the image above, but the diagram must have short wavelengths and a high frequency.

- In the first row of the table below, rate the frequency for each wave. In the second row, rate the energy

	Radio waves	Micro wave	Infra red	Visible light	UV	Xray	Gamma rays
Frequency	1	2	3	4	5	6	7

Energy	1	2	3	4	5	6	7
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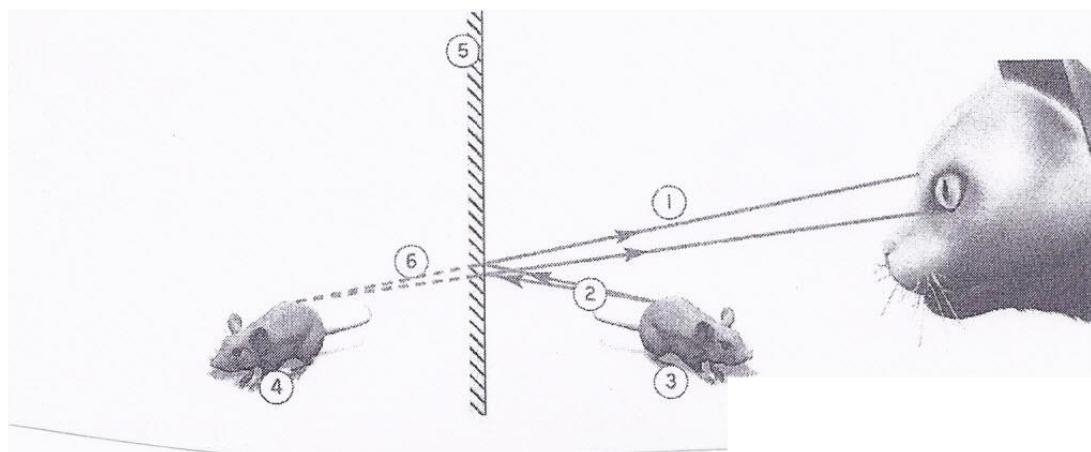
7. Explain why we can see different colours.

The object absorbs all the colors and reflects the color you see (ex: banana is yellow, reflects yellow)

8. Explain the process Rebounding light that occurs when a light ray hits a different medium and ‘bounces back’ to the medium from which it came from. (ex: you looking at a mirror)

9. Label parts 1 to 6, which is the real and which is the virtual image?

- 10. Reflected rays
- 11. Incident rays
- 12. Object
- 13. Virtual image
- 14. Mirror, reflection surface
- 15. Prolonged reflected rays

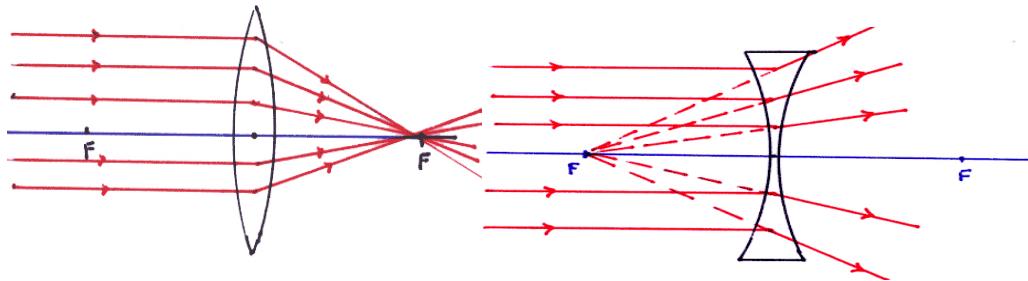


16. Explain the process of refraction.

Deviation of light ray as it passes from one transparent medium to another (light rays bending)

Different densities!!!

17. What are the differences between the images below? Circle the F and box the F^1 for each.



Primary focal point is after the lens in the convex lens
And before the lens in the concave lens

18. Label all the parts discussed in class and give their function.



19. Explain how a sound wave is produced? Vibrations that travel through a medium

20. What are differences between light and sound waves? Light waves don't need a medium and travel faster than sound

21. What is the pathway followed by a sensory signal?

Sensory receptor-transformer-sensory neuron

22. What are the functions of the ear?

Hearing and balance

23. Name four non-tactile functions of the skin.

Protection, insulation, excretion, produces vitamin d, produces melanin

24. Name four conditions that must be met for a substance to be tasted

Must have flavor

Can dissolve in saliva

High concentration

Come in contact with taste buds

25. The following statements are connected to the steps in perceiving sound. Put them in order:

- a) Vibration of the ossicles ripples through the vestibule liquid. **4**
- b) The pinna picks up sound vibrations from the air. **1**
- c) The vibration of the eardrum makes the ossicles vibrate. **3**
- d) Nerve cells transform the stimulus into nerve impulses. **6**
- e) Vibrations in the air make the eardrum vibrate. **2**
- f) The vibrations are transmitted to the cochlea. **5**
- g) The auditory nerve transmits the information to the cerebrum. **7**