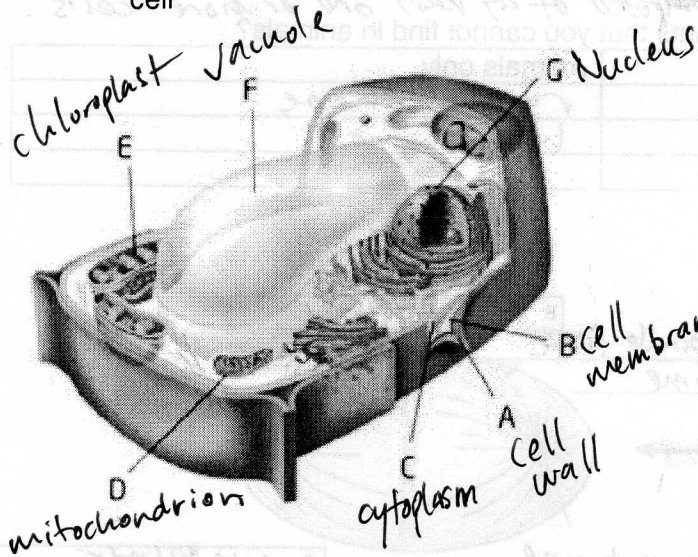
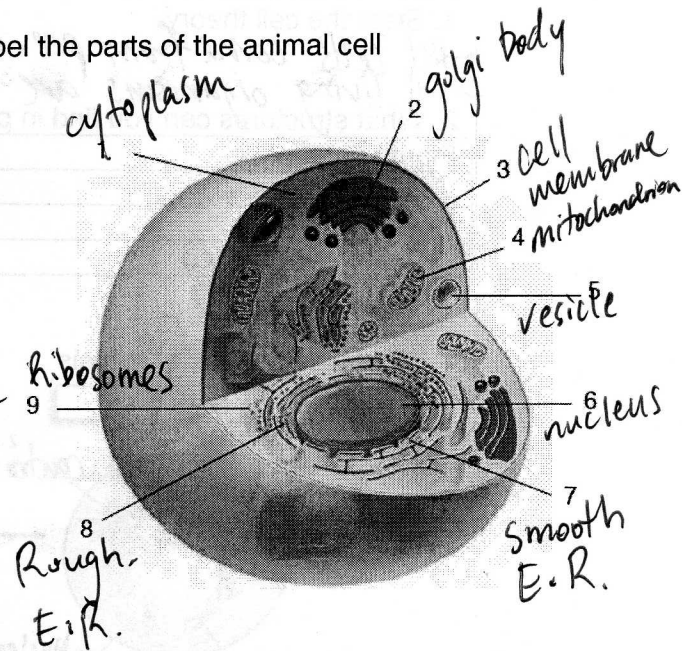


### Part A Cell Diagrams

1. a) Label the parts of the plant cell



b) label the parts of the animal cell



### Part B Matching

Match the description in column a with a term in column B. Write the letter of the response in the blank on the left. (1 mark each)

Column A

- B 1. Manufactures ribosome parts, RNA.
- A 2. Structure that forms the outer boundary of an animal cell.
- F 3. Not found in animal cells.
- D 4. Site of protein synthesis.
- E 5. Special structures in the cell that perform specific functions.

Column B

- ~~A~~ cell membrane
- ~~B~~ nucleolus
- C. mitochondria
- ~~D~~ ribosome
- ~~E~~ organelles
- ~~F~~ cell wall
- G. nuclear membrane
- H. nucleus

E-R = Endoplasmic Reticulum.

### Part C Fill in the Blanks

Complete the following table by filling in the correct cell part or function.

Cell Part	Function
cytoplasm	Gel-like material inside cells
Nucleus	Directs cell activities
Endoplasmic Reticulum	Connects to nucleus, transports material
Ribosomes	Manufactures proteins
Mitochondria	Produces ATP energy
Chromatin	DNA that is not condensed (not during mitosis)
Chloroplast	found only in plants → produces energy using sun
vesicle	Stores water, food, and waste
Golgi body	Sorts/packages protein for transport out of cell
lysosome.	Digests wastes

## Part D Plant cells vs. Animal Cells

1. State the cell theory

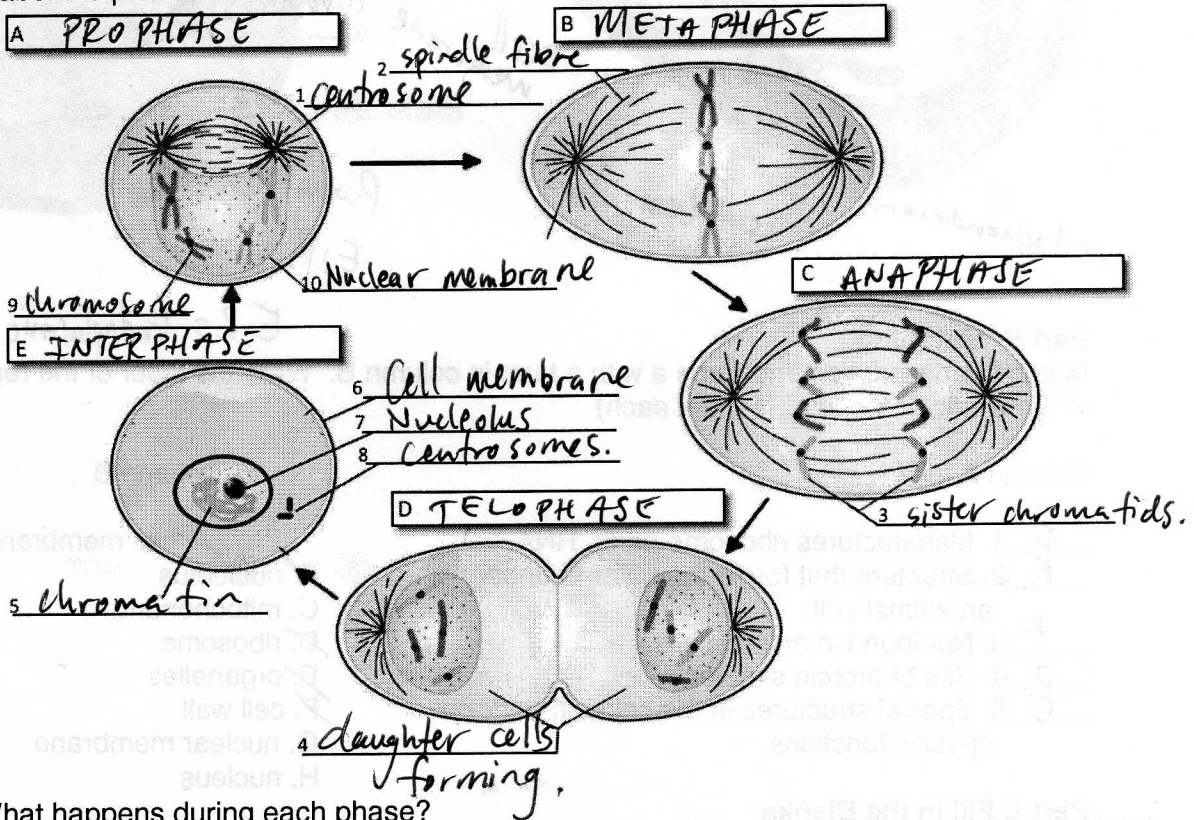
- All cells come from pre-existing cells - Cells are the basic functional unit of life.
- All living organisms are composed of at least one or more cells.

2. What structures can you find in plants that you cannot find in animals?

Plants only	Animals only
Cell wall	round shape
Chloroplasts	lysosomes
large vacuole	

## Part E Mitosis:

1. label the phases of mitosis



2. What happens during each phase?

Phase	Description of what happens
Interphase	Cell is performing its function.
Prophase	Chromosomes condense, Nuclear membrane starts to disappear, centrosomes move to opposite ends of cell.
Metaphase	Chromosomes line up along the middle of the cell. Spindle fibres attach to centromeres of sister chromatids
Anaphase	Spindle fibres pull chromosomes to opposite ends of cell.
Telophase	Cell membrane pinches in. Nuclear membrane begins to form around chromosomes, chromosomes lengthen back into chromatin, spindle fibres disappear.

\* Nuclear membrane completely dissolved.

2. Why do cells divide?

Growth, Reproduction, Repair, Influence.

3. How is cytokinesis in animal cells different from cytokinesis in plant cells?

Animal = Cell membrane pinches in (binary fission).

Plant = Cell plate forms from vesicles which then forms a new cell wall.

4. How do DNA, chromosomes, genes and protein relate to each other?

Long molecules of DNA form chromosomes. Genes a specific sections of chromosomes that code for specific proteins.

5. What causes a mutation in DNA?

Mutagens can cause DNA to mutate (e.g. toxic chemicals, radiation exposure, smoking, etc.).

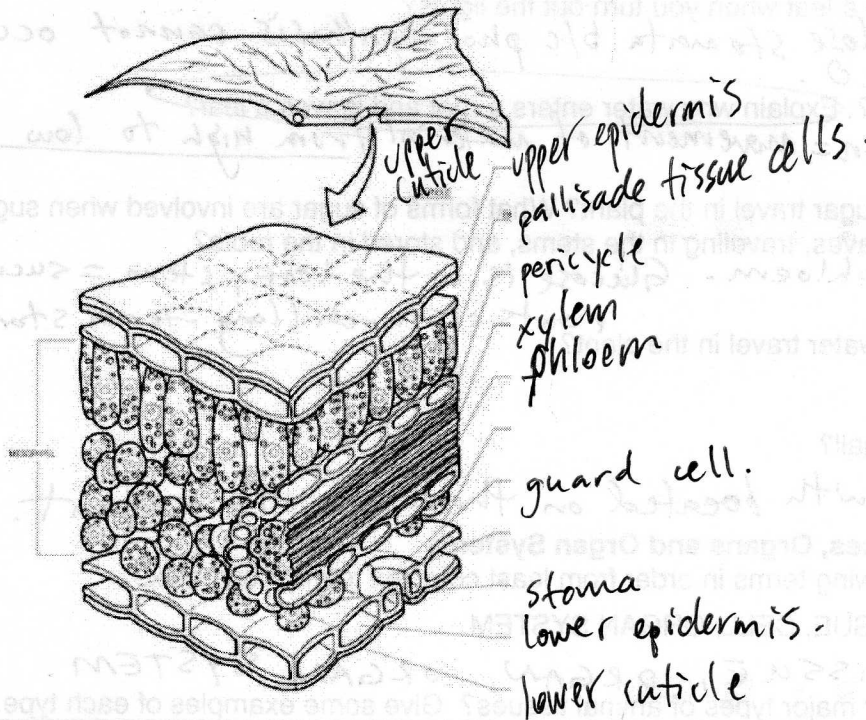
6. What is a tumour? (Growth)

Abnormal clump of cells that can be either benign (non-cancerous) or malignant (cancerous).

7. What is cancer?

Abnormal cells that divide uncontrollably and have no functions. Potential to spread to other parts of the body if they reach the blood stream.

Part F. Label the diagram of the leaf. Describe the function of each part.



1. Where is meristem found in plants?

Root tips or terminal bud of plants.

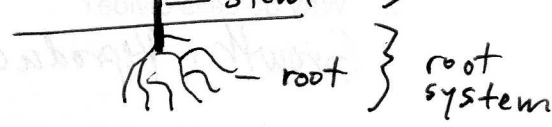
2. What kinds of tissue can a meristem cell become?

Any type b/c they are unspecialized cells.

3. Why do lateral buds not grow until the apical meristem is removed?

Auxin prevents lateral bud growth. Once the apical (terminal) bud meristem is removed, auxin is no longer released and the plant can grow outwards.

4. Draw a plant. Label the four organs of the plant.



5. Explain the difference between fibrous roots and tap roots.

Tap roots dig deep into ground, ~~there~~ one main large root.

Fibrous roots spread out near the surface of the ground. Many small roots.

6. Explain the process of transpiration

Root Pressure - Push from below  
 Evaporation of water @ leaf - pull from above. } H<sub>2</sub>O is absorbed from the ground into the plant which travels up the stem to the leaf. H<sub>2</sub>O is needed for photosynthesis.

7. What enters and exits through the stomata?

Enters - CO<sub>2</sub> Exits - O<sub>2</sub> & water vapour.

8. What do guard cells do?

Control the opening & closing of stomata.

9. What is photosynthesis? Where does photosynthesis occur? → PALLISADE CELLS.

Special process only found in plants that converts CO<sub>2</sub> & H<sub>2</sub>O into glucose (sugar) and O<sub>2</sub> using the sun's energy.

10. What happens to a leaf when you turn out the lights?

Guard cells close stomata b/c photosynthesis cannot occur. Conserves H<sub>2</sub>O.

11. What is diffusion? Explain why water enters a root and leaves a leaf?

Diffusion = movement of material from high to low concentration.

12. a) Where does sugar travel in the plant? What forms of sugar are involved when sugar is made in the leaves, traveling in the stems, and stored in the roots?

Sugar travels in the phloem. Glucose is in the leaf, stem = sucrose roots = starch (long-term storage).

b) Where does water travel in the plant?

Xylem.

13. What is a plant gall?

Abnormal growth located on the stem of a plant.

**Part G: Cells, Tissues, Organs and Organ Systems**

1. Arrange the following terms in order from least complex to most complex:

ORGAN, TISSUE, CELL, ORGAN SYSTEM

CELL, TISSUE, ORGAN, ORGAN SYSTEM.

2. What are the four major types of animal tissues? Give some examples of each type.

Type	Examples
Connective	Bone - support & protection Fat - storage of energy, insulation & padding throughout body.
Nervous	- relay signals/info from brain (motor) - detect info from environment (sensory)
Muscle	Skeletal - movement, attached to bones (voluntary) Smooth - lines stomach/intestines/blood vessels (involuntary)
Epithelial	Skin - cover exterior surface of body. Columnar - line stomach/intestines

cardiac heart (involuntary).  
 nutrients & waste body.

3. What is a stem cell?

Unspecialized cell that can produce various specialized cells.

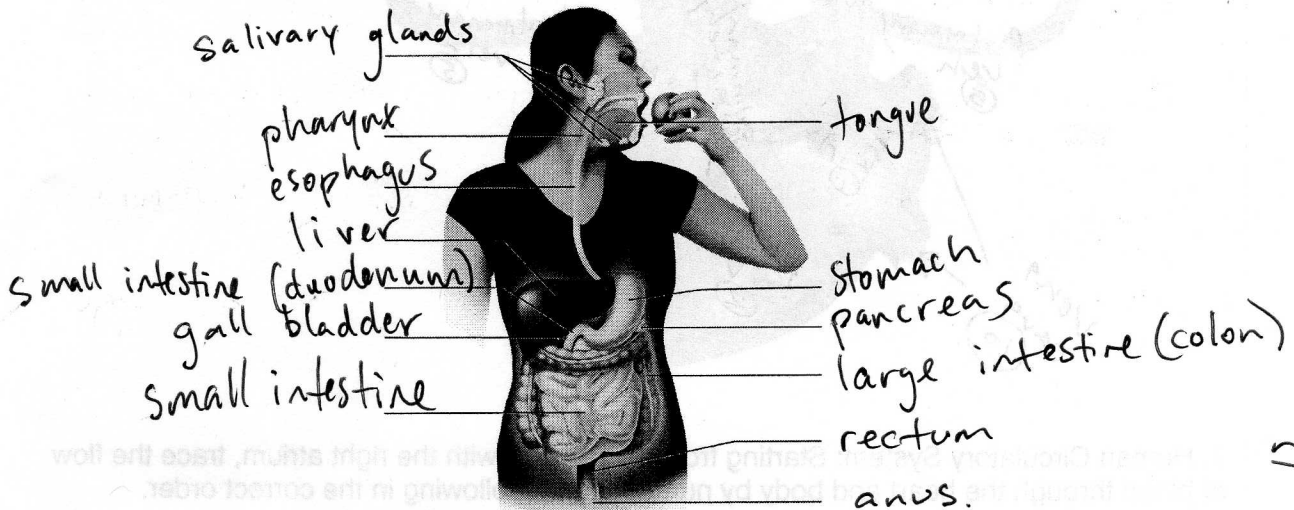
4. What kinds of medical imaging technology are used to explore the human body?

X-Ray, CT or CAT scan, Ultrasound, MRI scan

5. What factors influence cell specialization in animals?

Digestion: Match the function with the part

- contents of a cell's cytoplasm.
- Environment
- Neighbouring cells



**Word list:** esophagus, rectum, anus, K, villi, mouth, stomach, large intestine, bile, salivary glands, small intestine, pancreas

Digestion begins in the mouth. Teeth chew the food, saliva wets the food and the salivary glands secrete salivary amylase to begin the digestion of carbohydrates.

Food travels down the esophagus into the J-shaped stomach where the following happens:

- Churning
- Acid and pepsin work to digest protein

Next, food passes into the small intestine where digestion of protein, carbohydrate, and fats occurs. Food is absorbed. Tiny villi increase the surface area for absorption.

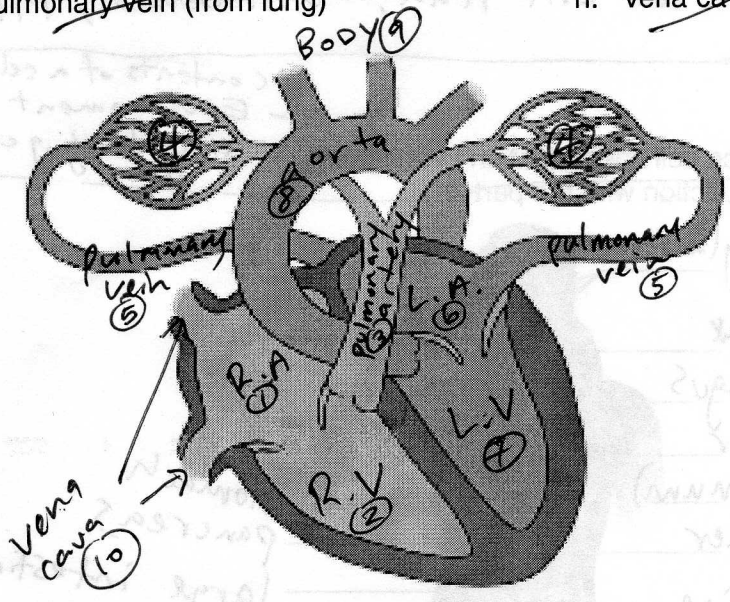
Three organs secrete substances for digestion. The **liver** makes digestive enzymes and bile which is stored in and released from the **gall bladder**. The pancreas also releases digestive enzymes into the small intestine.

The food passes into the colon or large intestine next. Here the water is absorbed. Vitamin K is produced.

Lastly, waste is stored in the rectum and passed out the hole called the anus.

6. Structure of the heart: Label the following parts of the human heart on the diagram below

- |  |  |
|--|--|
| a. <del>aorta</del>                      | e. <del>pulmonary artery (to lung)</del> |
| b. <del>left atrium</del>                | f. <del>right atrium</del>               |
| c. <del>right ventricle</del>            | g. <del>left ventricle</del>             |
| d. <del>pulmonary vein (from lung)</del> | h. <del>vena cava</del>                  |



7. Human Circulatory System: Starting from and ending with the right atrium, trace the flow of blood through the heart and body by numbering the following in the correct order.

- |                              |                             |
|------------------------------|-----------------------------|
| a) <u>1</u> right atrium     | f) <u>4</u> lungs           |
| b) <u>6</u> left atrium      | g) <u>2</u> right ventricle |
| c) <u>3</u> pulmonary artery | h) <u>7</u> left ventricle  |
| d) <u>10</u> vena cava       | i) <u>9</u> body cells      |
| e) <u>8</u> aorta            | j) <u>5</u> pulmonary veins |

For questions 1-3, fill in the name of the blood vessel.

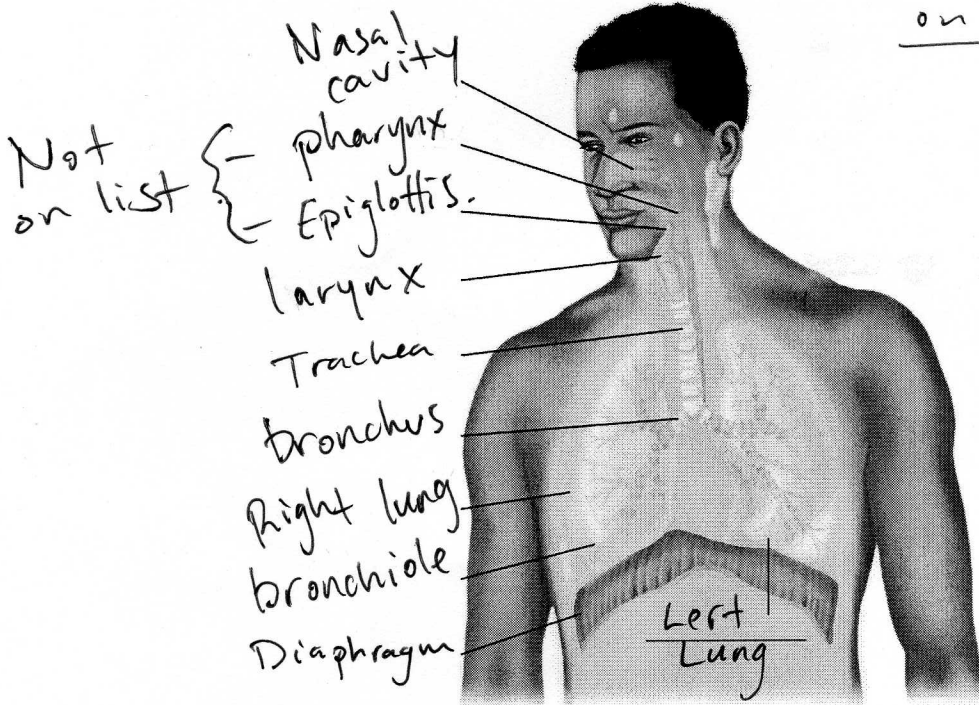
- arteries 1. vessels which carry blood away from the heart.
- veins 2. vessels which carry blood toward the heart.
- capillaries 3. tiny blood vessels with walls that are only one-cell thick.

For questions 4-5, fill in the letter of the part.

- atria 4. upper chambers of the heart that receive blood.
- ventricles 5. lower chambers that pump blood out of the heart.
- pulmonary artery 6. the only artery in the body rich in carbon dioxide
- pulmonary vein 7. the only vein in the body rich in oxygen

8. Label the figure correctly with the words from the list below.  
Choices: lung, diaphragm, trachea, bronchus, bronchiole, alveoli, larynx, nasal cavity.

Not  
on diagram.



10. Describe the function of each organ system:

- a) circulatory system: transports materials (blood, nutrients, waste, gases)
- b) endocrine system: produces & releases hormones.
- c) nervous system: Detects changes in environment & signals responses.
- e) urinary system: removes liquid wastes from body.  
(excretory)
- f) digestive system: breakdown of food, absorbs nutrients & removes wastes.
- g) respiratory system: Controls breathing, exchange of gases ( $O_2$  &  $CO_2$ ) in lungs.

11. a) How does the human digestive system cooperate with the circulatory system?

Blood passes near the villi where nutrients are absorbed and carried into the blood stream. Circulatory system delivers nutrients & oxygen to cells & tissues involved in digestion.

b) How does the human respiratory system cooperate with the circulatory system?

The air we breathe travels deep into our lungs (alveoli) where gas exchange occurs. Blood vessels surround the alveoli.  $CO_2$  rich blood is carried to the lungs where  $O_2$  is exchanged.  $CO_2$  is absorbed into the lungs and  $O_2$  is absorbed into the blood.  $CO_2$  is blown off during exhalation and  $O_2$  is transported back to heart then to various parts of the body.