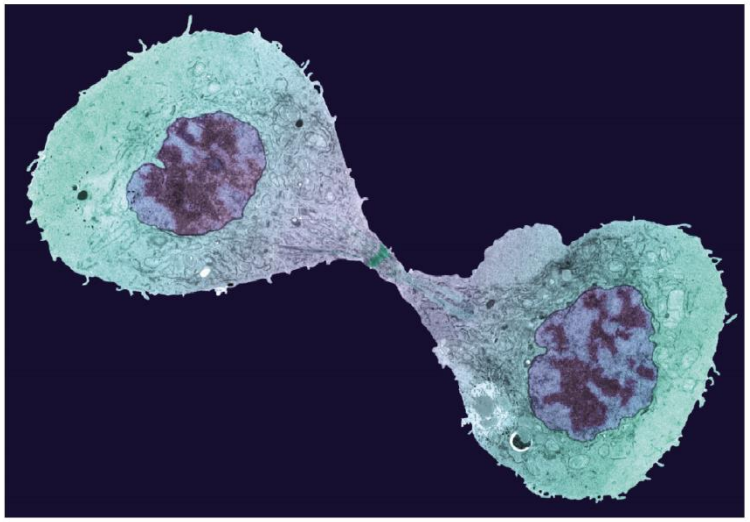
Unit 4:



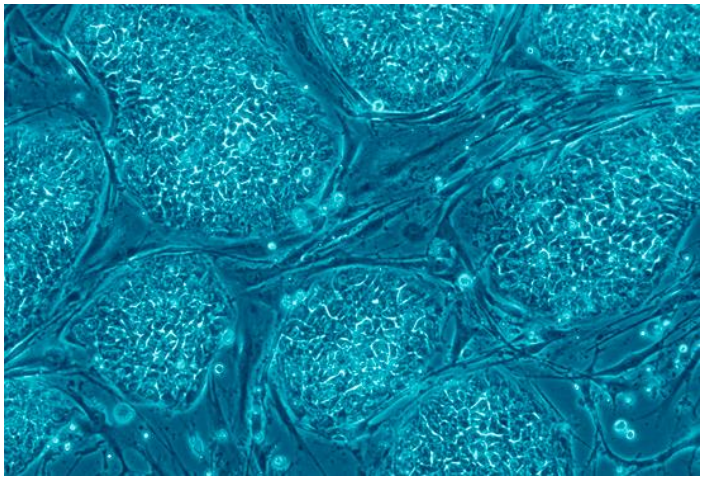
Cells, Tissues, & Organs Systems

Ch. 10: *The cell*

Cells & Living Things

What are living things made of?

- Early idea: all living things are made of air, fire and water
- Now: all living things are made of cells (cell theory)
- Cell: *the basic, functional unit of life*



The Cell Theory States:

- The cell is the basic unit of life.
- All living things are made of one or more cells.
- All cells come from other living cells.

Characteristics of Living Things

All living things…

- 1.Grow
- 2.Move
- 3.Respond to stimuli
- 4. Reproduce

1. Growth

- A result of the cells in your body **increasing** in number
- New cells will grow to **replace** old cells that die

2. Movement

A change in position, shape or location (**locomotion**)

3. Respond to Stimuli

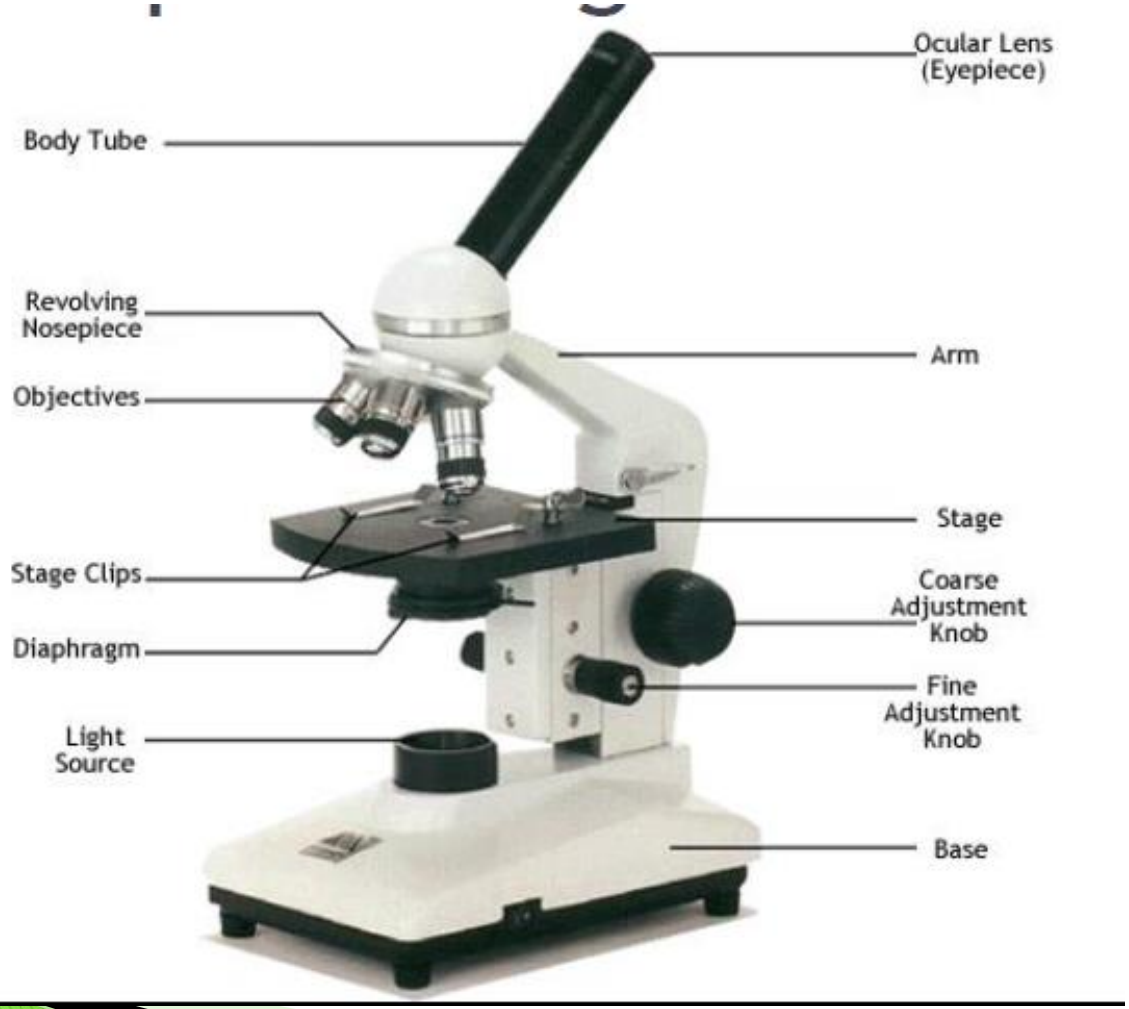
- Stimulus: anything that causes an organism to react.
- May be external or internal

Identify the stimulus and response:

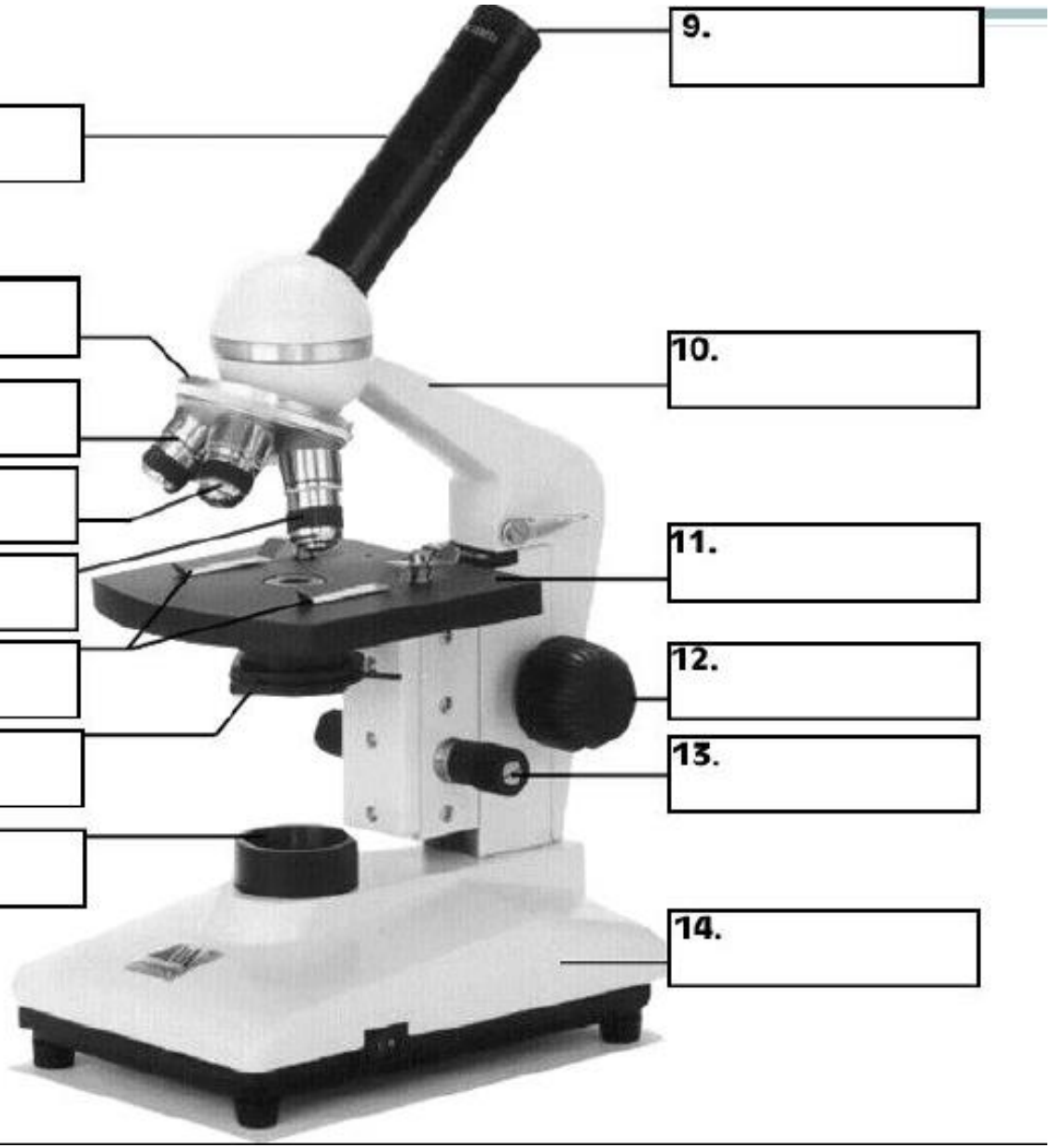
4. Reproduction

- Producing more of the same kind (**offspring**)

The Compound Light Microscope FOLADBLE



Review



The Compound Light Microscope

PART	FUNCTION
Eyepiece	
Body tube (barrel)	
Coarse adjustment knob	
Fine adjustment knob	
Objective lenses	
Revolving nosepiece	
Stage	
Iris diaphragm	
Light source	
Base	
Arm	

Microscope Magnification

Total Magnification= *power of objective lens **X** power of eyepiece lens*

Eyepiece lens (**10x**)

Objective lenses:

- Low (**4x**)
- Medium (**10x**)
- High (**40x**)

- Example: You are observing an onion cell under medium power. What is the magnification?

- Example: You are looking at a hair root under high power. What is the magnification?

Questions in Textbook

- Page 401
  #'s 2, 6, 7, 8, and Pause & Reflect
- Microscope Assignment
- Microscope Lab

Cell Organelles:

1. Cell membrane:

- Surrounds and protects the contents of the cell
- Controls the movement of materials in and out of the cell

Found in both plant and animal cells

2. Cytoplasm:

- Jell-like fluid in which the organelles float
- Helps to move materials like food to different parts of the cell

- Found in both plant and animal cells

3. Cell wall:

- Tough, rigid structure that give plant cells their box-like shape
- Made mostly of cellulose

- Found *only in plant cells!*

4. Nucleus:

- The “control centre” of the cell
- Large round structure often visible
- Contains the chromosomes

- Found in both plant and animal cells

5. Vacuole:

- Balloon-like spaces in the cytoplasm
- Store materials that can not be used right away
- Found in both plant and animal cells

(many small ones in animal cells,
few large ones in plant cells)

6. Mitochondrion:

- Oval, bean-like structures
- Produces energy by breaking down food particles

- Found in both plant and animal cells

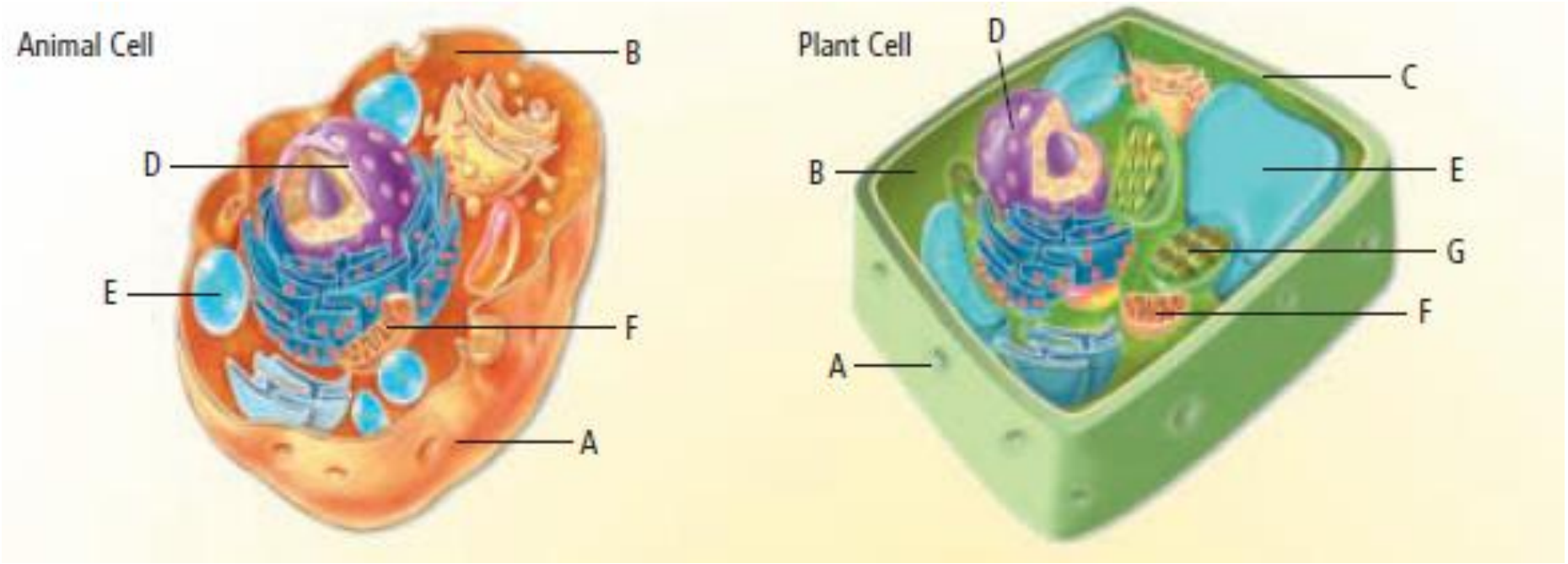
7. Chloroplast:

- Green structures that contain chlorophyll
- Capture the sun's energy for photosynthesis

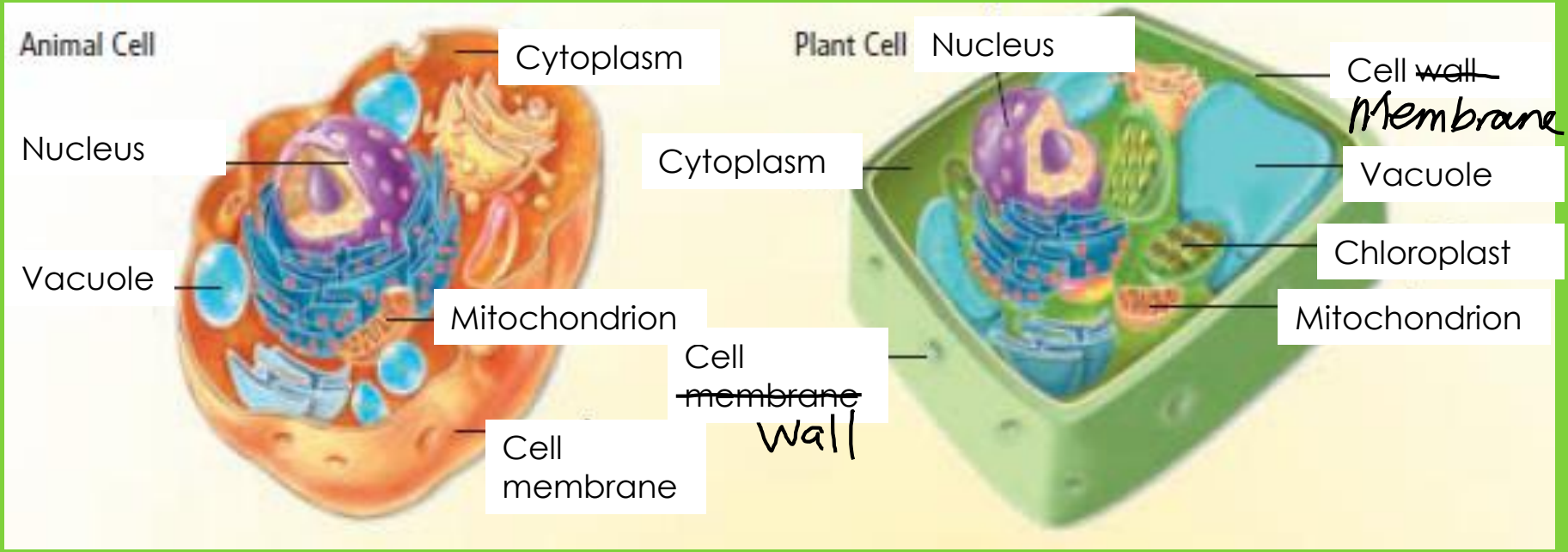
- ***Found only in plant cells!***

Organelle	Animal Cell	Plant Cell
Cell Membrane	✓	✓
Cytoplasm	✓	✓
Cell Wall	*x*	✓ rigid, box shape
Nucleus	✓	✓
Vacuole	✓ many, small	✓ few, large
Mitochondrion	✓	✓
Chloroplast	*x*	✓ photosynthesis

Plant VS Animal Cells



Plant VS Animal Cells



Questions from Textbook

- Page 415: #s 1–10, 13–15
- Page 416: #s 9–13
- Cell Assignment

Dividing Cells

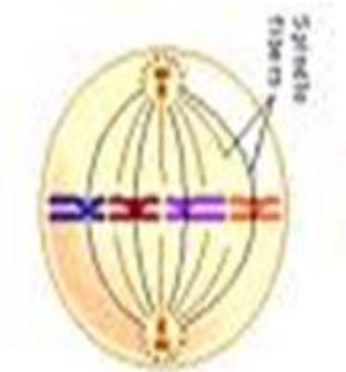
- Necessary for **growth** and **reproduction**
- Will replace cells that are **dead** or in need of **repair**
- How does this happen?
  A process called ***mitosis***

Mitosis

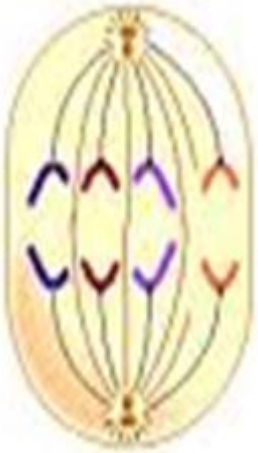
- Occurs in body cells (***somatic cells***)
  NOT in sex cells (egg and sperm cells)

- **Bacteria** cells reproduce like this

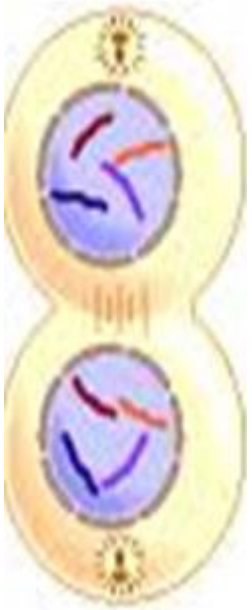
Prophase



Metaphase



Anaphase



Telophase

Energy for Cells

- Cells need energy for all life processes.
- Energy is stored in food called **glucose**(a type of sugar)
- To release energy cells must carry out **cellular respiration**. Here the energy is converted to another form of energy.

Energy for Cells

- Takes place in the **mitochondrion**.
- Most energy is released as **heat**.
- **Oxygen** is necessary for cellular respiration.
- **Carbon dioxide** and **water vapour** are waste gases produced. These are **removed** from the cell.

Questions from Textbook

Page 415: #16

End of Chapter Questions

- Page 416-417
- Cell in a Bag project

- Bill Nye Video