

Unit 4: Cells

Review Guide

LEARNING TARGETS

Place a checkmark next to the learning targets you feel confident on. Then go back and focus on the learning targets that are not checked.

- Identify the parts and functions of the light microscope.

Resources:

Textbook Section A14

Student Glossary

Microscope Lab

Microscope Labeling Practice

* Extra notes online

- Describe the structure and function of organelles in a typical cell.

Resources:

Textbook Section 7.2

Student Glossary

Notes: Cell Organelles

Cell Project

Organelle Practice Sheet

- Differentiate between prokaryotic and eukaryotic cells.

Resources:

Textbook Section 7.1

Student Glossary

Notes: Prokaryotes vs. Eukaryotes

- Compare and contrast structural differences between a plant and animal cell.

Resources:

Textbook Section 7.2

Student Glossary

Notes: Plant vs. Animal Cells

Cell Project

Plant & Animal Cell Lab

- Recognize the relationship between a cell's structure and function.

Resources:

Notes: Cell Function and Structure

LT: Identify the parts and functions of the light microscope.

1. In order to view a specimen under high power, which objective should you always start with?

Scanner lens

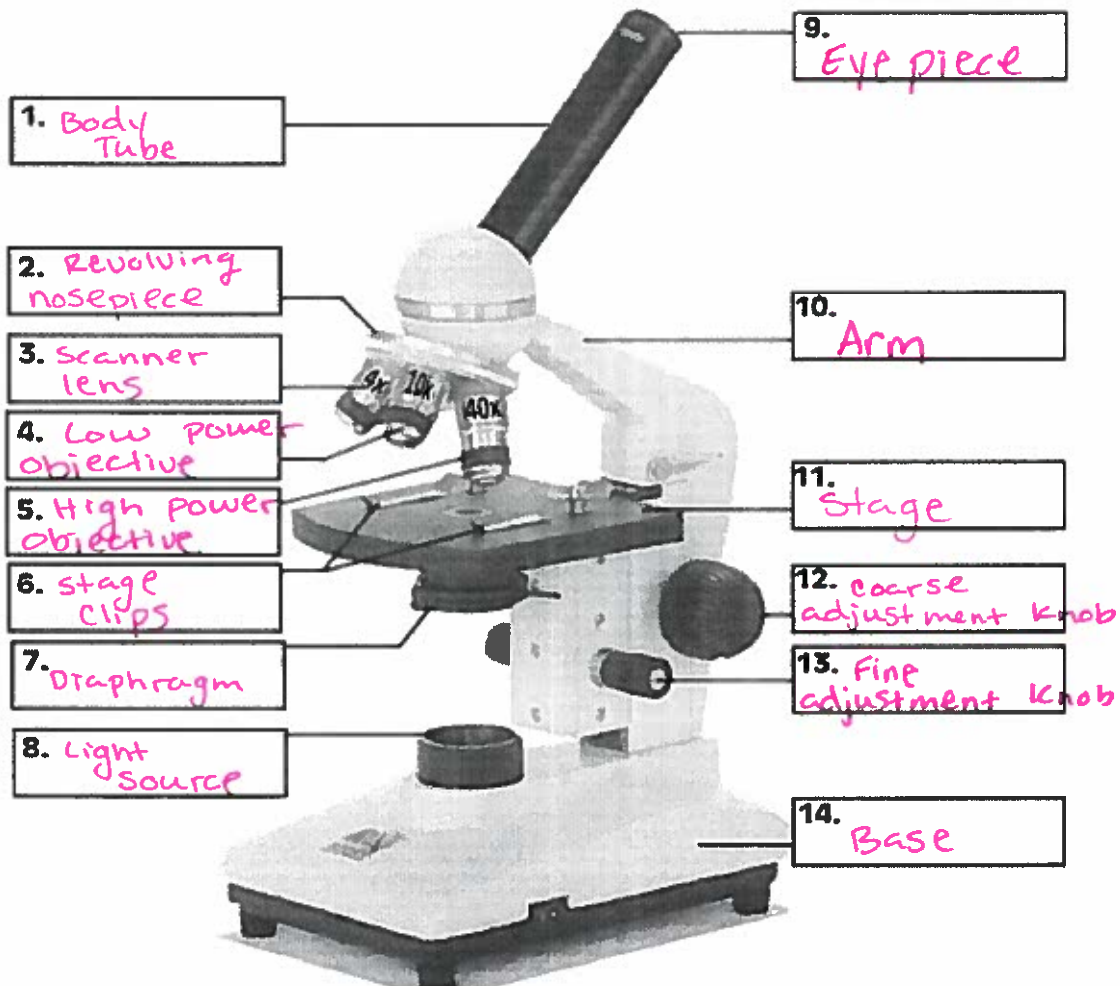
2. When working under scanner and low power, which parts of the microscope can be used to focus?

Coarse adjustment knob and Fine adjustment knob.

3. When working under high power, what is the ONLY part of the microscope that you may use to focus? Why?

Fine adjustment knob. The coarse adjustment knob will move the stage too much and can crack the slide.

4. Label the parts of the microscope below.


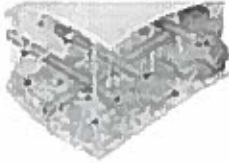



5. Use the diagram from question four to complete the table below.

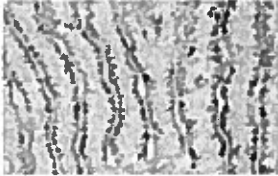

| Number | Name of Microscope Part | Function of Microscope Part |
|--------|-------------------------|---|
| 1 | Body Tube | maintains proper distance between eye piece and the objectives. |
| 2 | Revolving nosepiece | Holds objectives; allows you to rotate the objectives. |
| 3 | Scanner Lens | used to locate specimens on a slide |
| 4 | Low power objective | magnifies an image 10x |
| 5 | High power objective. | magnifies an image 40x |
| 6 | stage clips | Holds slide in place on the stage |
| 7 | Diaphragm | changes the amount of light passing through the specimen |
| 8 | Light source | provides the light that shines through the specimen(s). |
| 9 | Eye piece | used to look into at the specimen on the slide. |
| 10 | Arm | Part used to carry the microscope. |
| 11 | Stage | Place where slides are held during viewing. |
| 12 | Coarse adjustment knob | moves stage up and down for focusing in scanner + low power |
| 13 | Fine adjustment knob | used for focusing under high power |
| 14 | Base | Bottom part of the microscope |


LT 2.2.1.A: Describe the structure and function of organelles in a typical cell.

6. Fill in the table below.

| Organelle Name | Function/Description | Illustration | Analogy |
|------------------------------|---|--|---------------|
| Mitochondria | Convert chemical energy into usable compounds (ATP) for the cell. |  | "power house" |
| Chloroplast | Convert solar energy (sun) to chemical energy (carbohydrates). | see Notes | |
| Cell wall | Rigid network of cellulose fibers that surrounds the cell membrane in plant cells; provides cells with structure and support | see Notes | |
| Cytoskeleton | <ul style="list-style-type: none"> • made of fibrous proteins • maintains cell shape • moves cell parts & helps cells move |  | |
| Smooth Endoplasmic Reticulum | Assembles lipids * NO ribosomes | see Notes | |
| Flagellum | Long, tail-like structure present in cells like sperm that moves these cells from place to place | | |
| Vacuole | Store material (water, salts, proteins, carbs). * larger central vacuole | see Notes | |

| Organelle Name | Function/Description | Illustration | Analogy |
|----------------|--|---|---------|
| Cell Membrane | <ul style="list-style-type: none"> Regulates materials entering and leaving cells. Protects + supports |  <p>the cell.</p> | |
| Ribosome | make proteins according to the DNA instructions | see Notes | |

| | | | |
|------------|--|--|--|
| Nucleus | Control center of cell, contains information in the form of DNA | see Notes | |
| Nucleolus | makes ribosomes | see Notes | |
| Lysosomes | Small, circular organelles that contain enzymes to break down food, bacteria, waste, old cell parts, or even the cell itself | see Notes | |
| Rough ER | <ul style="list-style-type: none"> Assembles proteins Ribosomes on ER |  | |
| Centrioles | organize cell division in animal cells. |  | |

| Organelle Name | Function/Description | Illustration | Analogy |
|-----------------|---|--|---------|
| Cytoplasm | Jelly-like fluid that fills a cell. | see Labs | |
| Golgi Apparatus | modifies, sorts, and packages proteins and lipids for storage or transport out of the cell. |  | |

7. Read each description below and then identify the cell structure.

- a. I'm strong and sturdy, getting through me is tough, and am only found in plants.

cell wall

- b. I'm a series of tubes, found all throughout the cell. I transport proteins and other things as well.

Golgi Apparatus

- c. I'm a real "powerhouse". I break down food, to release energy.

mitochondria

- d. I'm full of holes, flexible, and thin. I control what gets out, as well as what comes in.

cell (plasma) membrane.

- e. Proteins are made here, even though I am quite small. You can find me in the cytoplasm or attached to E.R's wall.

Ribosomes

- f. I'm a sac filled with water, food, enzymes, or waste.

Vacuoles

- g. Found only in plant cells, I make food for the plant using the sun's energy.

Chloroplast

- h. I contain many enzymes, I break down large molecules for the cell.

Lysosomes

LT 2.2.2.A: Differentiate between prokaryotic and eukaryotic cells.

8. Compare and contrast prokaryotic and eukaryotic cells using the table below

| Prokaryotes | Both | Eukaryotes |
|--|--|--|
| <ul style="list-style-type: none"> • Simple • <u>No</u> nucleus • <u>No</u> organelles • unicellular • Bacteria | <ul style="list-style-type: none"> • Cell (plasma) membrane • DNA • Ribosomes | <ul style="list-style-type: none"> • Complex • Nucleus • Many organelles • Multicellular • Animal/plant cells |

9. What types of cells are prokaryotic?

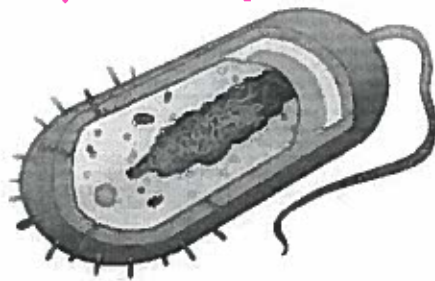
Bacteria

10. What types of cells are eukaryotic?

Animal + Plant cells

11. Identify the drawings below as either prokaryotic or eukaryotic.

Prokaryotic



Eukaryotic



Eukaryotic



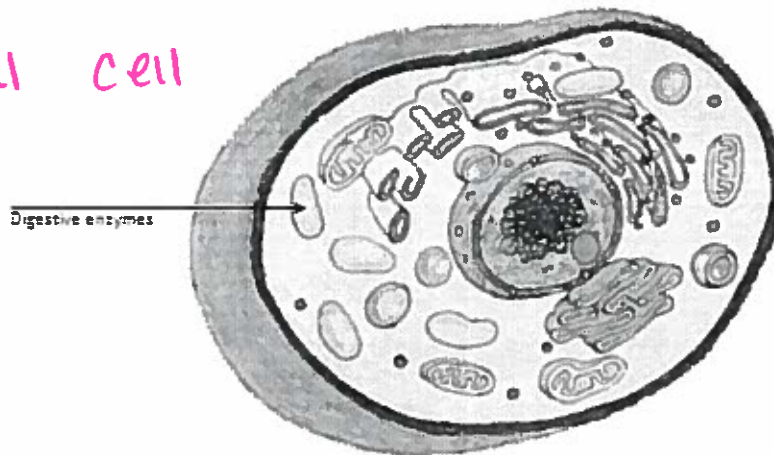
Prokaryotic



LT 2.2.2.B: Compare and contrast structural differences between a plant and animal cell.

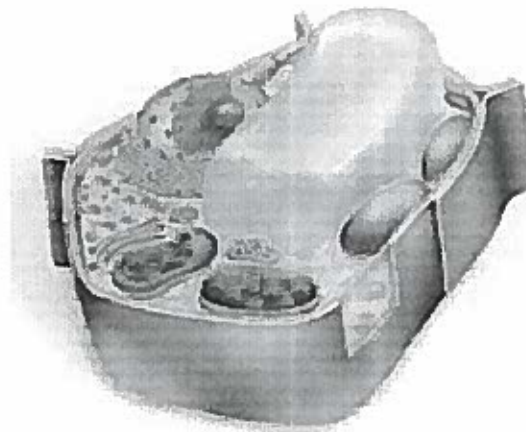
12. What type of cell is shown in the diagram below?

Animal cell



13. What type of cell is shown in the diagram below?

plant cell



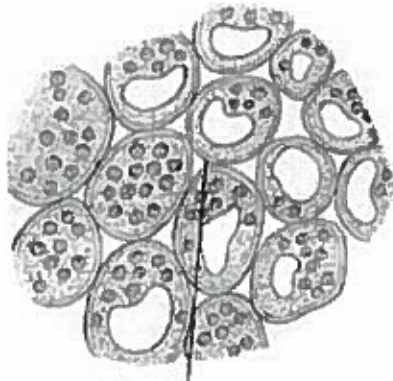
14. List the organelles that are only found in a plant cell.

- Cell wall
- Chloroplasts
- Large central vacuole

15. List the organelles that are only found in an animal cell.

- Centrioles
- Lysosomes (very rare in plant cells)

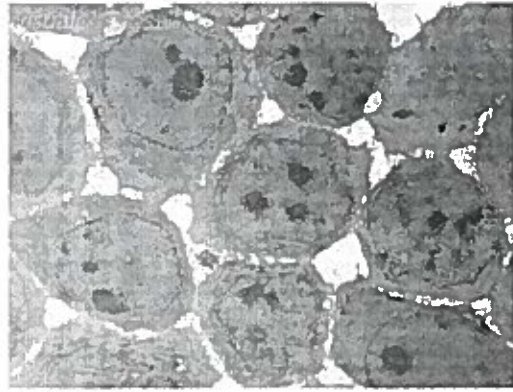
16. Identify each of the microscope pictures as either plant or animal cells and explain how you know.



thin primary cell wall

plant cells:

- cell wall
- Large vacuoles
- chloroplasts



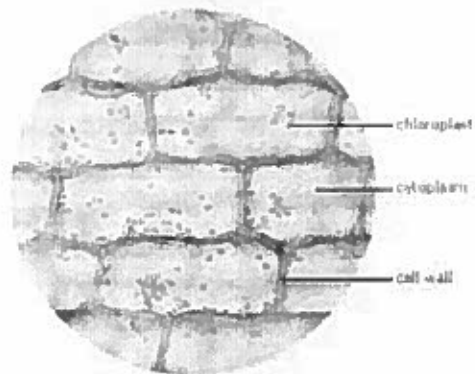
- Animal cells

- cell membrane
- No large vacuoles



Animal cell

- cell membrane
- shape (irregular)

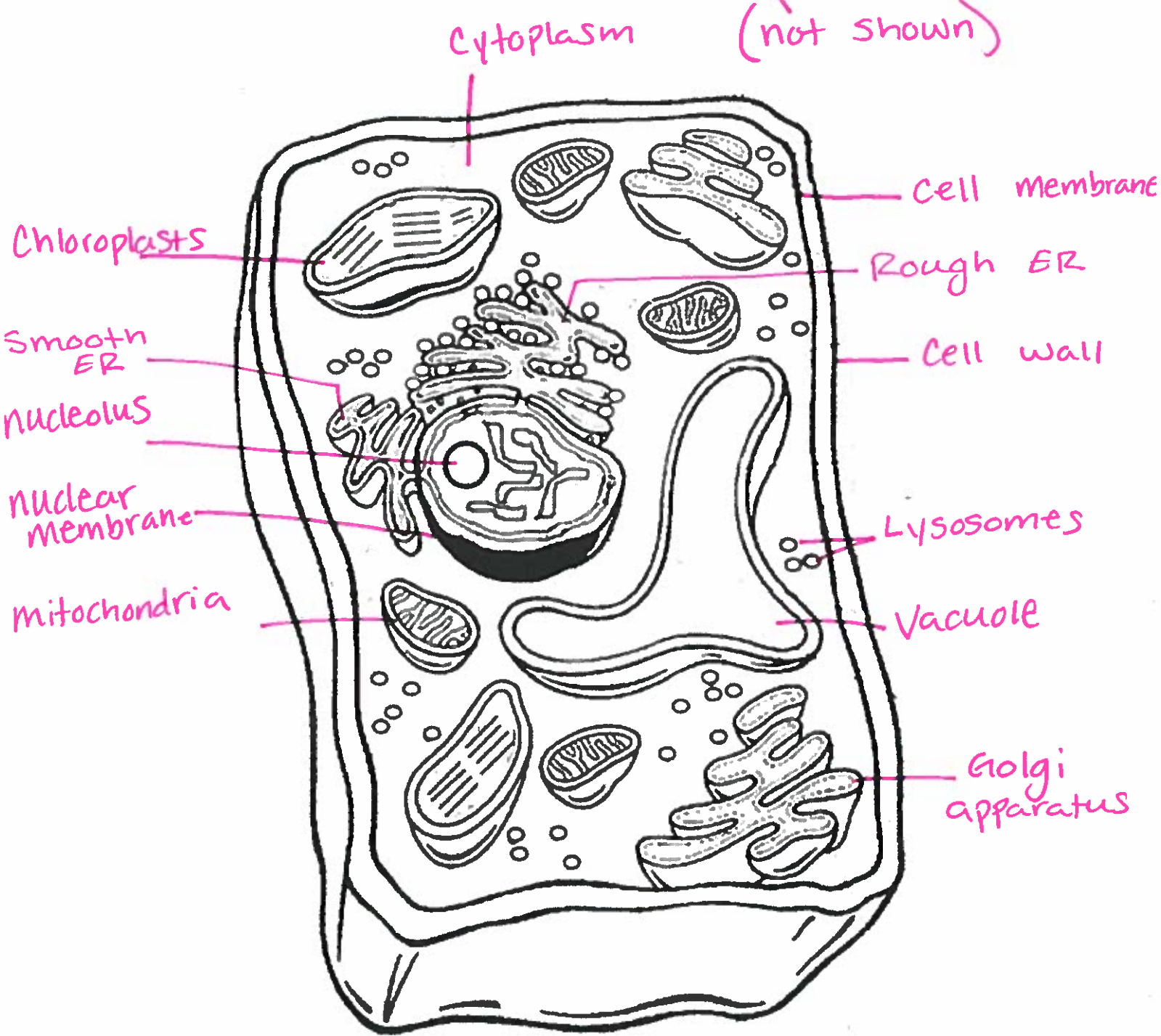


plant cell

- square/rectangle shape
- cell wall
- chloroplasts

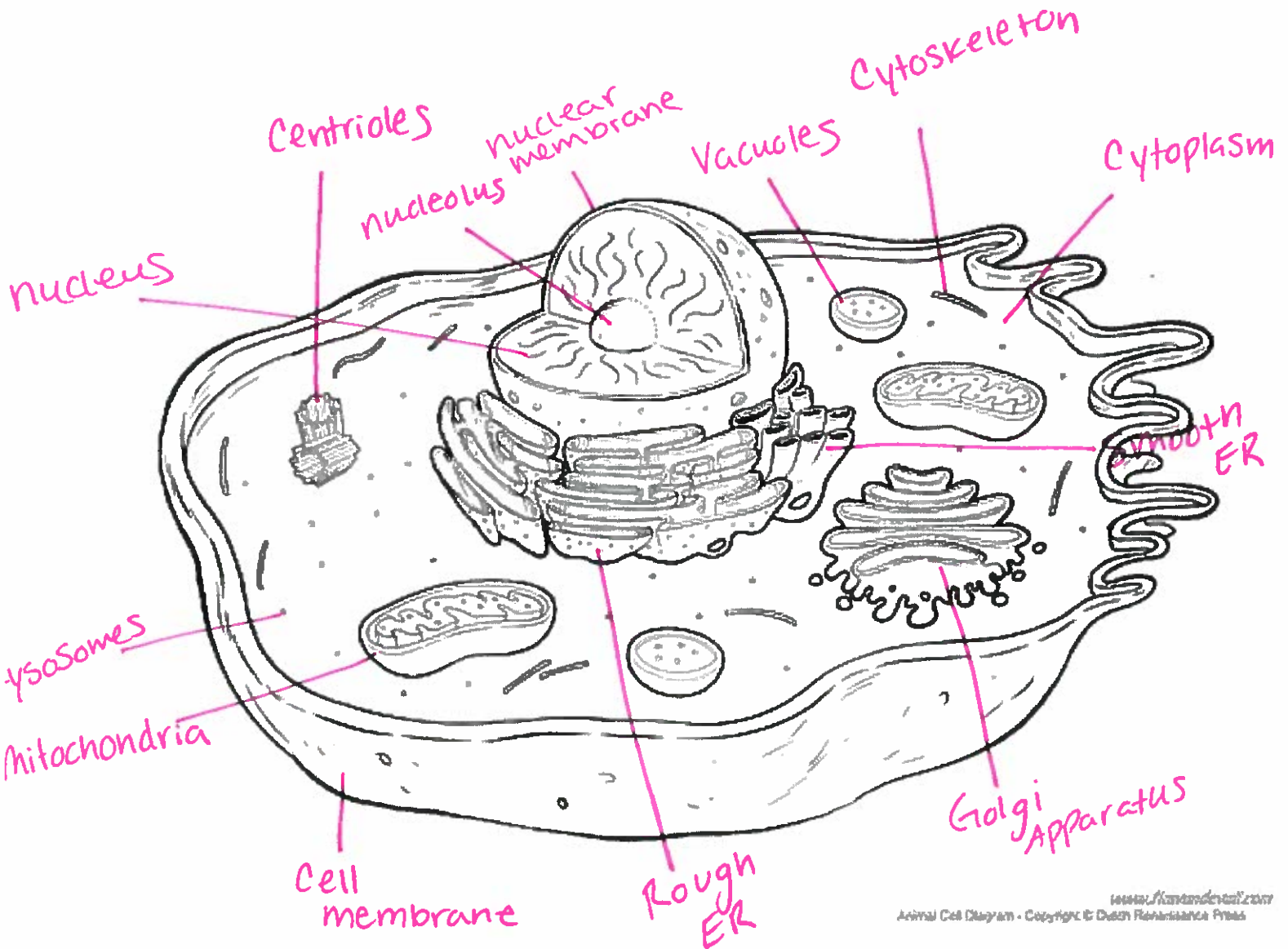
17. Label the different organelles found in a plant cell (you can either draw lines and label or color code)

- Cell Membrane Cell wall Chloroplasts Cytoplasm Cytoskeleton Golgi body Lysosomes
Mitochondria ~~Nuclear Membrane~~ Nucleolus Nucleus Rough ER Smooth ER Vacuole



18. Label the different organelles found in an animal cell (you can either draw lines and label or color code)

- Cell Membrane Centrioles Cytoplasm Cytoskeleton Golgi body Lysosomes Mitochondria
~~Nuclear Membrane~~ Nucleolus Nucleus Rough ER Smooth ER Vacuoles



Animal Cell Diagram - Copyright © Dutch Renaissance Press

LT 2.2.2.C: Recognize the relationship between a cell's structure and function.

19. What is the relationship between a cell's structure and its function?

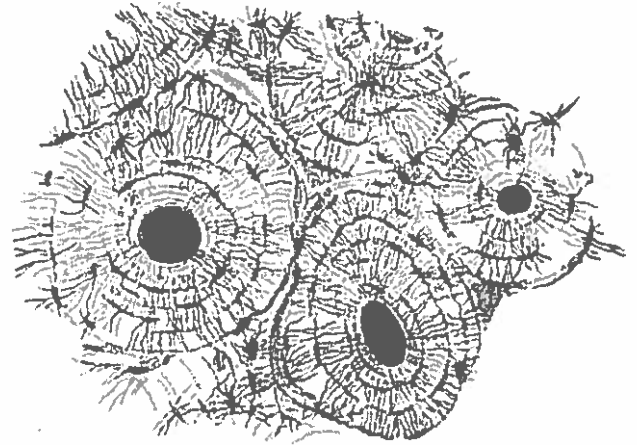
Cell shape is directly related to its function.

20. Explain why it makes sense that red blood cells are round.

Red blood cells are round and biconcave so they can flow easily through blood vessels.

21. Look at the following cell, based on its structure what do you think it's function is?

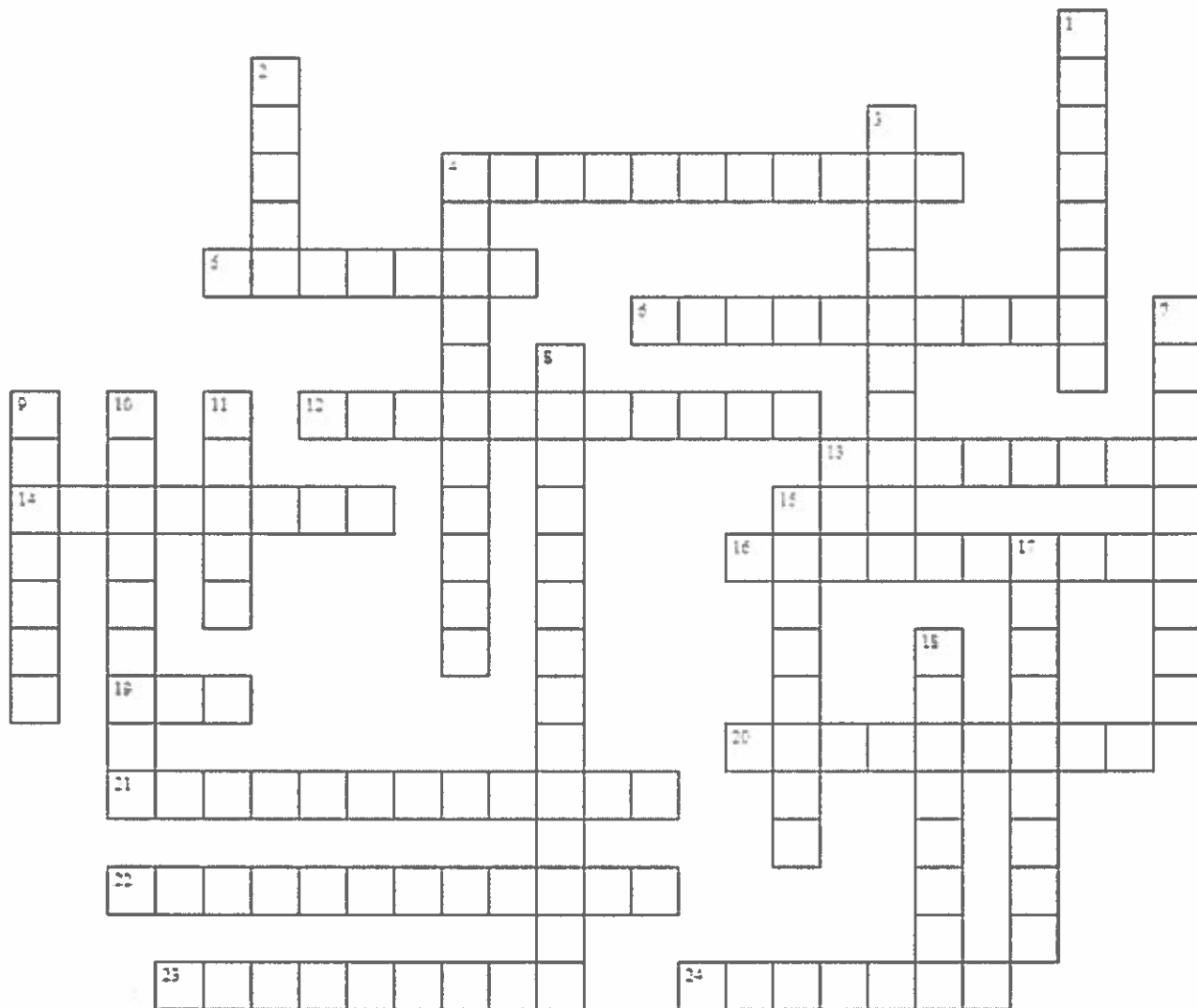
Structure / support



22. What shape would you expect a muscle cell to have if its function is to be able to stretch?



long, for ~~exp~~ contracting
and stretching

EXTRA VOCABULARY PRACTICE**ACROSS**

- 4 Form of DNA during cell division
- 5 Small circular packages within a cell
- 6 Lacking membrane-bound organelles
- 12 Pigment found in green plastids
- 13 Moves a cell with a whip-like motion
- 14 Study of cells
- 16 The ability to change into different cell types
- 19 Form of energy produced by the mitochondria
- 20 Located along the endoplasmic reticulum or in the cytoplasm
- 21 Makes usable energy for the cell from glucose
- 22 System of "highways" that also provides structure and support to a cell
- 23 Where ribosomes are made
- 24 Spotted with ribosomes along its surface

DOWN

- 1 Site of lipid production
- 2 Discovered cells in cork
- 3 Pair of structures that assist in cell division
- 4 Site of photosynthesis
- 7 A cell with a nucleus
- 8 The UPS of a cell
- 9 Fluid-filled storage area
- 10 Jelly-like material in the cell
- 11 Help move substances across cell surfaces
- 15 Chromoclasts and leukoplasts are examples of these
- 17 Uncolled form of DNA
- 18 Contains digestive enzymes

