

## BIOLOGY 11 – PRE-LAB EXERCISE

2+4

Name: **Answer Key**

Lab Day & Time:

5

### Microscopy / Cell Structure & Function

#### Lab 2: Microscopy

1. What two types of microscope will we be using in this laboratory exercise?  
**binocular dissecting microscope (stereomicroscope) & compound light microscope**

What are the relative advantages for each of these types of microscope?

**binocular dissecting microscope:**

Greater working distance, field of view, and depth of field □ can view large, whole subjects  
Can use either reflected (surface) or transmitted light □ can view either solid or transparent objects

**compound light microscope:**

Greater magnification & resolution □ can view much smaller subjects and with much greater detail

2. What other type of microscope is described in the Lab Manual? **Electron microscope (transmission & scanning)**

What advantage does this type of microscope have over our microscopes? **Even greater magnification & resolution □ can view much, much smaller subjects and with much, much greater detail**

3. Why is a compound microscope called “compound”? **Uses two lenses working together**

4. Define **magnification**. **Increasing the apparent size**

Define **resolution**. **Ability to discern details (minimum distance to distinguish two points)**

5. Look at **Figure 2.5** in your *Lab Manual*. Identify the indicated parts and label the blanks on the picture of the microscope. Identify the parts of the microscope described by the following function:

A moveable platform that allows accurate positioning of the slide. **Mechanical stage**

The part of the microscope that you look into. **Oculars**

The objective lenses are attached to this rotating component. **Nosepiece**

The control knob that is used to focus the image, but only used with the lowest-power objective.  
**Coarse-adjustment focus**

The control lever used to adjust the light shining through the subject. **Diaphragm control lever**

The objective to be in place both when beginning to use the microscope and when putting it away.  
**Scanning (lowest power) objective**

## Lab 4: Cell Structure & Function

6. What are the two main macromolecule components of a cell membrane? **phospholipids & proteins**

What is the plasma membrane? **membrane around the whole cell**

In addition to the plasma membrane, where are other cell membranes?  
**membrane around organelles within the cell**

7. Study **Figure 4.1** and **Table 4.1** in your *Lab Manual*. Identify the cell component or organelle described by the following structure and/or function:

Membranous canals without ribosomes often used for lipid synthesis. **smooth endoplasmic reticulum**

Place where the genetic information is stored. **nucleus**

Organelles with a double membrane that produce most of the cell's energy (ATP). **mitochondria**

Stack of saccules functioning to process and distribute molecules. **Golgi apparatus**

Small sacs used to transport substances among organelles and the cell membrane. **vesicles**

Microtubules and filaments responsible for the shape and movement of the cell and its parts. **cytoskeleton**

Ribosome-studded saccules and canals used for protein synthesis. **rough endoplasmic reticulum**

Membranous vessel containing digestive enzymes. **lysosome**

8. Define:
- selectively permeable. **regulation by the cell determining what substances may cross its cell membranes**
  - diffusion. **the net movement of molecules from a region of high concentration to a region of low concentration**
  - osmosis. **diffusion of solvent molecules (water)**
  - dialysis. **diffusion of solute molecules across a membrane**
  - facilitated transport. **diffusion across an otherwise impermeable membrane by mean of carrier proteins (gates)**
  - active transport. **transport across a membrane against the concentration gradient by mean of carrier proteins (pumps) that requires the expenditure of energy**
  - tonicity. **the total concentration of solutes in a solution that increase its attraction for water by osmosis**
9. Read “**Experimental Procedure: Tonicity in Potato Strips**” in Laboratory 4 of your *Lab Manual*.
- What are two standard variables in this exercise? **same potato for both strips; size of strips; volume of liquid; time of soaking; size of tubes; temperature; etc.**
  - What is the independent variable in this exercise? **concentration of salt solution (0% or 10%)**
  - What is the dependent variable in this exercise? **stiffness/limpness of potato strip after soaking**
- If you used animal tissue, like blood, instead of potato in this experiment, what would you predict would happen to its cells when immersed in pure water? **take on water > swell > burst (hemolysis)**