Name: _____

Microbiology
Microscopy

Objectives: Learn theory involved in microscopy.

Specific objectives:

- Demonstrate procedures used in microscopy
- Define the terms associated with the microscope.
- Learn limits of bright field microscopy.

Materials required:

- Specimen: Selected slides
- Microscope

Record values found on the microscope and perform calculations of total magnification for each lens.

Lens	Magnification of Objective lens	Magnification of Ocular lens	Total magnification	Numerical Aperture
Low Power				
High-dry				
Oil Immersion				
Condenser lens				

Questions

1. Why isn't the magnification of both ocular lenses of a binocular microscope used to calculate total magnification? (1 pt)

2. What is the total magnification for each of the lens settings on a microscope with 15x oculars and 10x, 45x, and 97x objective lenses? (1 pt)

3. On a microscope with a numerical aperture of 1.25 for the condenser and 0.25 for the low power objective, and a filter that selects a wavelength of 520 nm, what is the limit of resolution on this microscope? (You will need to see my PowerPoint lecture to obtain the correct formula as it is different from the one used in your text). (0.5 pt)

   Will you be able to distinguish two points that are 330 nm apart as being separate, or will they blur together? (0.5 pt)

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4. On the same microscope as in question #3, the high dry objective lens has a numerical aperture of 0.85 nm. What is the limit of resolution on this microscope? (0.5 pt)

   Will you be able to distinguish two points that are 250 nm apart as being separate, or will they blur together? (0.5 pt)

5. Calculate the limit of resolution for the oil immersion lens on your microscope. Assume an average wavelength of 500 nm. (0.5 pt)

6. Describe the correct method for carrying a microscope. (0.5 pt)

7. What objective is used to initially find the field in a microscopic preparation? (0.5 pt)

8. Which objective(s) can safely be immersed in oil? (0.5 pt)

9. List the steps in correct order from placing a slide on the stage to observing the specimen under oil immersion. Use terms associated with the microscope, i.e. fine focus knob, etc. (4 pts)