FLINN SCIENTIFIC

Name_____

Build a Microscope Worksheet

Data Table

Microscope Length	Distance Between the Object and the Objective End of the Microscope		Observations (size, appearance, distortion, etc.)
	Trial 1	Trial 2	
30 cm			
35 cm			
40 cm			

Calculations and Post-Lab Questions

1. How does the image of the object change as the length of the microscope increases?

2. The centers of the objective and eyepieces lenses are both approximately 1.5 cm from the ends of the microscope tubes. Calculate the true separation distance between the objective and eyepiece lenses for each microscope length.

Microscope length **Lens separation**

3. Find each microscope length, calculate the average value for the Distance Between the Object and the Objective End of the Microscope. Then, add 1.5 cm to each average distance to calculate the total distance between the object and the center of the objective lens.

4. Use Equation 1 from the *Background* to calculate the position of the real image (image distance) formed by the objective lens, for each microscope length. *Note:* The focal length of the objective lens is 5 cm.

5. Where does the position of the real image fall in relation to the front focal point of the eyepiece lens?

6. Use Equations 2, 3, and 4 to calculate the magnification of each microscope. (Assume the real image produced by the objective lens is located at the front focal point of the eyepiece.)

7. Why does the microscope's magnification increase as the length of the microscope tube expands?

Advanced Post-Lab Question

8. Draw (to scale) the positions of the object, intermediate images and final image on the retina of the eye for the 30-cm long microscope used in this experiment. Assume the focal length of the eye's lens is 1.7 cm, and is centered at approximately the same location as the eyepiece lens. Scale: Each mark represents 3 cm. *(Optional)* On a separate sheet of paper, draw the ray diagram for the 30-cm long microscope.