Cell Size Activity   **Name** _____

Task:
You will measure the size of a microscope's field of vision, estimate the size of a cell, and draw scaled to size pictures of cells you observe under 100X and 400X magnification.

Materials:
- compound light microscope   - Slide C: animal cell slide
- Slide A: graph paper slide   Elodea leaf
- Slide B: allium slide   Distilled water and salt water

Safety:
Use care and caution in handling the microscope.
Slides are glass and have sharp edges if cracked or broken.
Use coarse adjustment to focus on lowest power only.
Keep both eyes open when using the microscope. If you cannot do this, use your hand to cover the eye you are not using to avoid eyestrain.

**Directions:**   Write all answers on the answer sheet and submit.
1. Pick up slide A. Hold it up to the light and observe the squares.
2. Slide A is a prepared slide of a square of graph paper. The lines are spaced 1.0 mm apart.
3. Place Slide A on the microscope slide and bring the graph paper into focus, using the lowest power.
4. When you look into the microscope, the whole area you see is the "field of view." Switch to a magnification of 100X and focus. Knowing that the lines of the graph paper are 1.00 mm apart, estimate the diameter of the field of view at 100X to the nearest 0.25 mm.
5. Return Slide A.
6. Place Slide B on the microscope stage. Slide B is a piece of onion skin tissue that has been stained and mounted for viewing.
7. Look closely at Slide B under the microscope and bring it into focus under the lowest power. Switch to 100X and focus. Find one row of cells that goes lengthwise across the middle of the field of view from one edge to the other. The cells may go from side to side, top to bottom, or diagonally. In the circle on your answer sheet, sketch only one row of lengthwise cells spanning the field of view.
8. How many cells did you see under 100X in the row that you drew?
9. In step 4, you estimated the diameter of the field of view at 100X. Record that value again on your answer sheet.
10. Use the values from 8 and 9 to devise a way of calculating the average length of one onion cell on your answer sheet.
11. Return slide B.
12. Obtain Slide C and place it on the microscope stage. Bring the cells into focus at the lowest power, then at 100X. Then switch to the highest power and focus. Sketch the cell as directed on your answer sheet.
13. Obtain 1 *Elodea* leaf from your teacher. Place it on a slide with a coverslip. Observe and sketch the chloroplasts. Look for cytoplasmic streaming.
14. Flood the slide with salt water as your teacher directs. Record your observations.
15. Now flood the slide with distilled water. Record your observations.
16. Switch the microscope back to the lowest power and turn off the power. Unplug the microscope and wrap the cord. Cover the microscope. Return all materials and submit your drawing.

4. Diameter of the field of view under 100X magnification is _____ mm.

7.
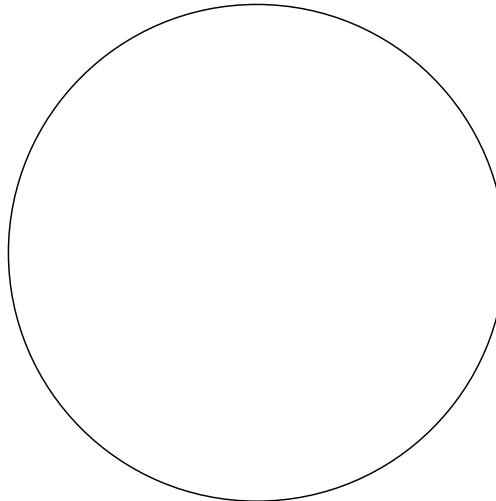
One row of cells under 100X power

8. Number of cells in one row in the sketch at 100X _____

9. Diameter of field of view at 100X: _____

10. Devise a method to calculate the length of one onion cell. Write out steps, use an equation, and show the math. Explaining your method is worth more points than the correct answer.

Length of 1 cell _____

Appropriate method for calculating magnification, clearly explained

12. Magnification at highest power: _____

Draw the cell, enlarged to scale at the highest power, in the box below. Your drawing should accurately show the shape and visible structures of the cell. Draw only what you see, and draw clear structural representations. Refer to cell diagrams in your text for reference as needed.
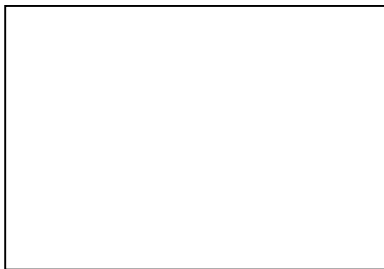
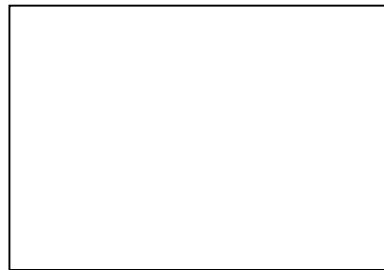Actual size of cell, as you estimated it _____ mm
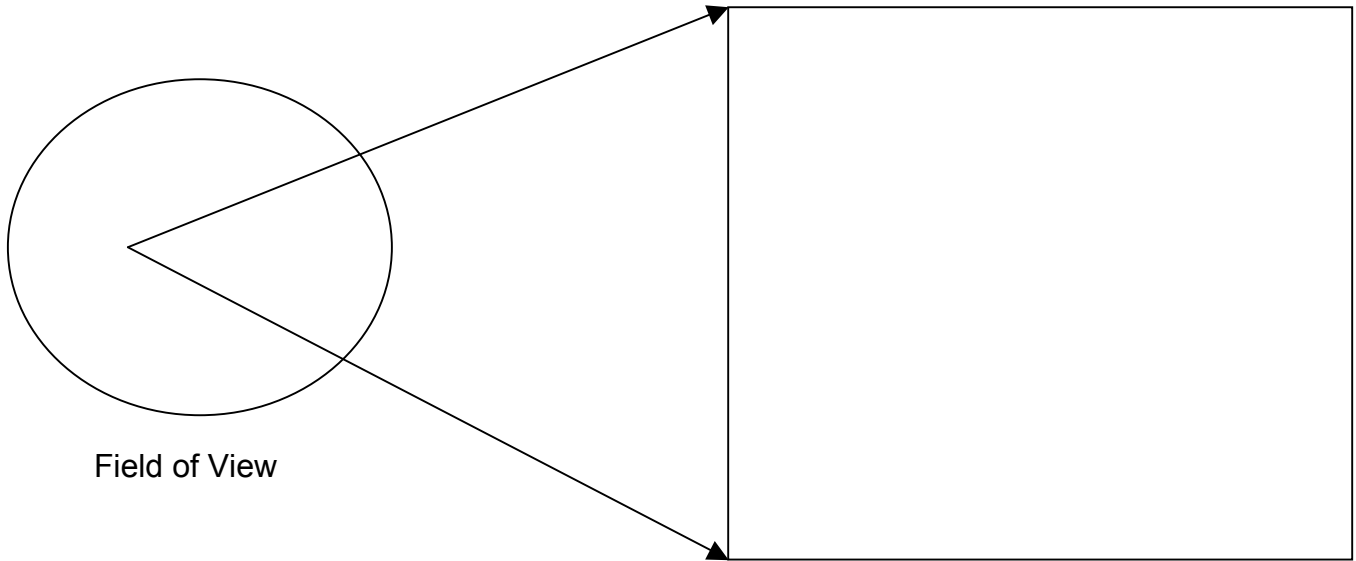
Field of View

Enlarged View of One Cell under _____
magnification.

13. Sketch of *Elodea* leaf:

Sketch of *Elodea* cell:

Sketch of *Elodea* cell in salt water:

Sketch of *Elodea* cell in distilled water: