**Questions “How big are cells?”**

*Use your own drawings and measurements to answer the following questions.*

1. **SIZE OF ONION CELLS**
   1. Somewhere between 200 – 400 µm **1p**
   2. Somewhere between 50 – 100 µm **1p**

*The following facts are given:*

* *A cubic decimeter (dm3) is 10 x 10 x 10 cm. This is 1 \* 10-3 m3. The volume is exactly 1 liter (1 L).*
* *A cubic centimeter (cm3) is 1 x 1 x 1 cm. The volume is exactly 1 milliliter (1 mL)*
* *A cubic micrometer (µm3) is 1 x 1 x 1 µm.*
  1. Volume is length \* width \* depth. **2p**  
     1 cubic micrometer (µm3) is 1 picoliter (1pL)  
     Example:   
     Volume = 300 \* 75 \* 75 = 1700 µm3
  2. Conclusion: onion cell is 1700x bigger. **1p**  
     Possible explanations: **1p**  
     Onion cells are really big (which is true).  
     Error is measuring  
     Theory is not correct.

1. **SIZE OF NUCLEI**
   1. Approximately 20 µm **1p**
   2. Somewhere between 5 and 20 mm **1p**
   3. Magnification = 10.10-3 / 20.10-6 = 0,20.103 = 200 **2p**
   4. Magnification microscope is 100x or 400x   
      Conclusion: cells were drawn with a larger (or smaller) **1p**  
      magnification.
2. **ELODEA CELLS AND BUCCAL TISSUE**
   1. Somewhere between 200 – 350 µm
   2. What is the average length of a cheek cell from your buccal tissue?
   3. Compare the answers to the previous two questions. What are the differences? What is your conclusion? Explain your answer!
   4. What is the diameter of a human nucleus?
   5. Compare this with the diameter of the nucleus of an onion cell. What is the difference? Why is it different? Explain your answer!
3. **PLASTIDS**
   1. What is the average diameter of a chloroplast of an elodea cell?
   2. What is the average diameter of an amyloplast of a potato cell?
   3. What is the average diameter of a chromoplast of a tomato cell?
   4. Given that plastids can transform from one plastid to another, what is your conclusion about the sizes of them? Why do they differ so much?

**END OF THIS TEST**