
A Comparison of Scale Assessment

Participant Guide

Assessment

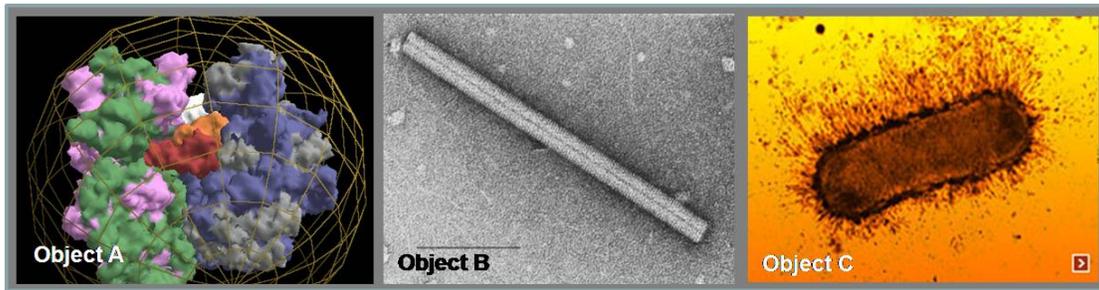
Now that you have completed the *Comparison of Scale Learning* Module and all of its activities, let's see what you have learned. This assessment determines your knowledge of three scales (macro, micro, nano) and the challenges faced when working within these scales.

There are 12 assessment questions below. Answer each to the best of your knowledge.

1. **What is the microscale range?**
2. **What is the nanoscale range?**
3. **Explain why the following statement would be unacceptable in a design summary about a microarray?**
"It is important that the width of the cantilever be very narrow in order to fabricate 10 cantilevers in one microarray."
4. **Cite an example of a microsystems device that requires components sized within the micro AND nanoscales. Indicate which components would be micro-size and which components would be nano-size.**

5. **Micro and nanosize devices are always fabricated using the same methods.**
1. True
 2. False
6. **What size devices use a "bottom up" fabrication (macro, micro, nano)?**
1. Macro
 2. Micro
 3. Nano
 4. Both micro and nano
7. **Describe or cite an example of finished product or object that was constructed using a "top down" fabrication or construction method. (*It does not have to be a microsystems or nanosystems devices*)**
8. **Describe or cite an example of a finished product or object that was constructed using a "bottom up" fabrication or construction method. (*It does not have to be a microsystems or nanosystems devices*)**

9. Which of the following objects has the largest diameter?



- Object a.
- Object b
- Object c
- You need a scale to answer this question

10. What has attributed to the overlap of micro and nanotechnologies?

11. You have been challenged to design a MEMS diagnostic tool to replace the current "tube or endoscope" used in endoscopy procedures. Currently, an endoscopy requires that a long tube be inserted into the esophagus to view the interior walls of the throat and esophagus. Your challenge is to design a tool that would be less invasive and would not require any type of anesthesia. Briefly explain your design, its overall size, and the size of critical components.

12. A human hair is 60 to 100 micrometers in diameter. How does this size relate to microsystem components?

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