You will have two different experiences during this next session of study. In one location you will investigate the parts and functions of a cell. In the other location you will work with a microscope to study a specimen, making observations and approximating its size.

**Activity 1: Microscope and Cell Study**

Visit the following website:

http://learn.genetics.utah.edu/content/begin/cells/insideacell/

1. Check off the structures once you have listened to each sound bite.
   - cell membrane
   - nucleus
   - mitochondria
   - lysosomes and vesicles
   - Golgi apparatus
   - cytoskeleton

2. What are two main differences between a plant and animal cell? Why are the differences important?

   _______________________________________________________
   _______________________________________________________
   _______________________________________________________
   _______________________________________________________

Visit the following website and familiarize yourself with how the scale works by moving the cursor on the image and scaling up and down the list of items.

http://learn.genetics.Utah.edu/content/begin/cellsSCALE

3. List three items from different parts of the scale and their sizes.
   a. _______________________________________________________
   b. _______________________________________________________
   c. _______________________________________________________

4. As the cursor moves to the right on the scale, what happens to particle size?

   _______________________________________________________
   _______________________________________________________
   _______________________________________________________

5. In terms of its size, what object was a surprise to you?

   _______________________________________________________
   _______________________________________________________
   _______________________________________________________

**MATERIALS NEEDED**

- Computer lab with two websites available
- Microscope slides
- Microscope grid stickers (1mm)
- Student Worksheet

**Students should be able to:**

- Measure the approximate size of an object under a microscope
- Draw a quick sketch of the object viewed under the microscope
- Identify parts of a cell
- Explain the differences between a plant and animal cell
Activity 2: Microscope Creepy Crawlers

Station 1:
Location Number: _____ (left of microscope)

1. Take a look at the magnification value located at the left side of the eye piece.
   - List the magnification of the objective lens = _________________
   - List the magnification of the eyepiece lens = _________________
   - Total magnification for this microscope set up = (multiply the two numbers above) = _______________

2. List the name of the item on your slide: _________________________________
   In the circle, sketch the item you see. *Use a pencil or colored pencils*
   Make three observations about the specimen.
   a. ___________________________________________________
   b. ___________________________________________________
   c. ___________________________________________________

3. Notice the grid that appears on your slide. Considering that every square is 1mm², approximate the length of the object.
   Object length = _________________

Station 2:
Location Number: _____ (left of microscope)
Note: Check to be sure the magnifications of the rotating lens is 4x.

1. Take a look at the magnification value located at the left side of the eye piece.
   - List the magnification of the objective lens = _________________
   - List the magnification of the eyepiece lens = _________________
   - Total magnification for this microscope set up = (multiply the two numbers above) = _______________

2. List the name of the item on your slide: _________________________________
   In the circle, sketch the item you see. *Use a pencil or colored pencils*
   Make three observations about the specimen.
   a. ___________________________________________________
   b. ___________________________________________________
   c. ___________________________________________________

3. Use the grid once more to approximate the length of the object, considering that every square is 1mm².
   Object length = _________________

4. Change the magnification to a higher power by rotating the lens wheel in a clockwise direction.
   Look at the image. What changes do you notice? ______________________________________________
   Has the size of the object actually changed? _________________________________________________
   What is the new magnification of the microscope? _____________________________________________

Before leaving this station, please rotate the lenses back to the 4X magnification.
To complete this module, you will need a set of computers or a computer lab reserved and an area for microscope work. If possible, prepare the computers with the website tabs so that the students simply need to click on the thumbnail to get to the desired location.

For the microscope activity, apply a 1mm grid sticker to the bottom of a creepy crawler prepared slide. This will be used to help the students estimate sample size.

We ordered the Creepy Crawlies slide sets from Amazon.

New York State Standards

Middle School

**Standards 1:** Mathematical: Key Idea 1: M1.1; Key Idea 3: M3.1a

**Standard 1:** Scientific Inquiry: Key Idea 1: S1.3; Key Idea 2: S2.1, S2.1a, S2.1d, S2.2a, S2.2b, S2.3, S3.1a

**Standard 2:** Information systems: Key Idea 1: 1.1

**Standard 4:** The Living Environment: Key Idea 1: 1.1, 1.1b, 1.1c, 1.1d, 1.1e, 1.1g, 1.1h

**Standard 7:** Key Ideas 2: 2.1 Working effectively, gathering and Processing information

**General Skills:** Safety skills, measuring

**Living Environment Skills:** Manipulate a compound microscope, classify