

**Microscope Mania**  
**Electron Microscopes**

Name \_\_\_\_\_

**The sites for this assignment are listed on the “Cells & Microscopes” page of the Kid Zone at <http://sciencespot.net/>.**

**SITE #1: MOS Scanning Electron Microscope**

Click the link for “How It Works” and then choose “Self-Paced Tour”.

1. What does SEM mean? \_\_\_\_\_
2. How do conventional light microscopes work? \_\_\_\_\_  
\_\_\_\_\_
3. What does the scanning electron microscope use to magnify images? \_\_\_\_\_
4. Why are the images black and white? \_\_\_\_\_
5. How does the SEM work? Read the captions and put the steps in order from 1 to 7.

\_\_\_ As the electron beam hits each spot on the sample, secondary electrons are knocked loose from its surface, which are counted by a deflector and sent as signals to an amplifier.

\_\_\_ The sample is placed inside the microscope's vacuum column through an air-tight door.

\_\_\_ A set of scanning coils moves the focused beam back and forth across the specimen, row by row.

\_\_\_ The final image is built up from the number of electrons emitted from each spot on the sample.

\_\_\_ Air is pumped out of the column before the electron gun emits a beam of electrons, which travels downward through a series of magnetic lenses designed to focus the electrons to a very fine spot.

\_\_\_ The Scanning Electron Microscope reveals new levels of detail and complexity in the amazing world of microorganisms.

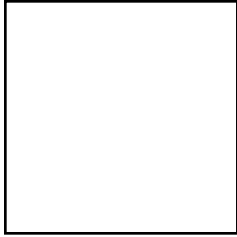
\_\_\_ SEM samples are coated with a very thin layer of gold by a machine called a sputter coater.

6. Watch the animation if possible.

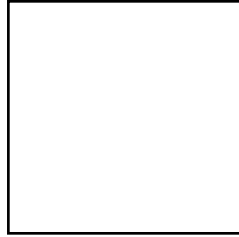
**SITE #2: Pfizer's Fun Zone** - Click the link for "Electron Microscope" and then click "Play Now".

1. What is E.Coli? \_\_\_\_\_

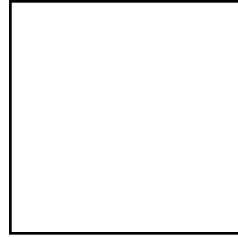
2. Slide the slider with the red dot to the different red marks to change magnification and use the focus (green dot slider) to make the view clearer. Draw what you see at each magnification (listed in the green area under the specimen's name.)



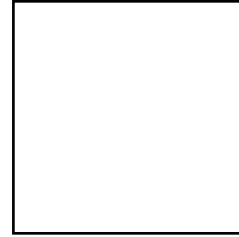
x 1000



x 5000



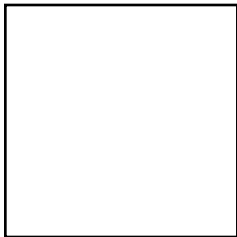
x 10,000



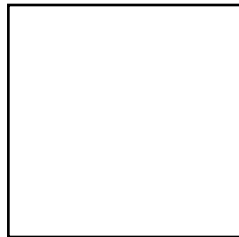
x 30,000

3. Choose another item to view. Write the name of the item below and draw what you see at each power. Be sure to label each diagram with the power of magnification (listed in the green area under the specimen's name.)

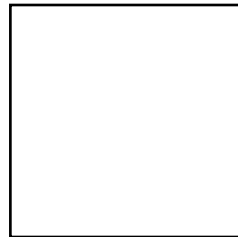
Item \_\_\_\_\_



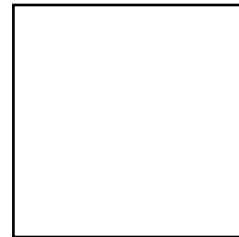
x \_\_\_\_\_



x \_\_\_\_\_



x \_\_\_\_\_



x \_\_\_\_\_

**Done with your worksheet?**

**Return to the main page of the Pfizer's Fun Zone and try the "Scrambler"**

**OR visit the other sites listed on the Cells & Microscopes page!**