

## Microscope Mania

Name \_\_\_\_\_

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

### SITE #1: Magnification Module

1. Select “Apollo Moon Rock” from the pop-up menu. View the rock at each of the different magnifications. Choose three other items from the list and view at the different magnifications.

(a) At which power do you see the greatest detail? \_\_\_\_\_

(b) At which power do you see the largest amount of the sample? \_\_\_\_\_

(c) At which power do you see the smallest amount of the sample? \_\_\_\_\_

2. What do you notice as you increase the magnification? \_\_\_\_\_

### SITE #2: 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.

\_\_\_ 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 micro-organisms.

\_\_\_ 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 #3: Powers of Ten

1. What is the first thing you see? \_\_\_\_\_ How far away is it? \_\_\_\_\_

2. What is the last thing you see? \_\_\_\_\_ How much is it magnified? \_\_\_\_\_

3. Write 2-3 sentences to summarize your observations of the Powers of Ten animation.

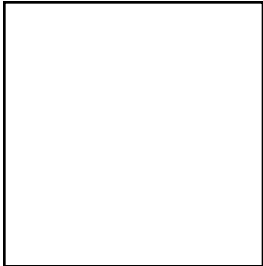
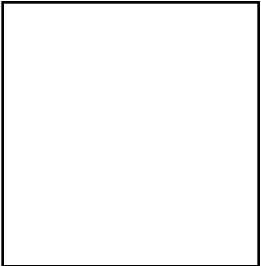
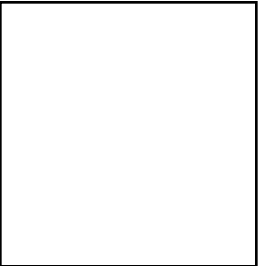

**SITE #4: Pfizer's Fun Zone**

Click the link for "Electron Microscope" and then click "Play Now".

1. What is E.Coli? To which kingdom would it belong? \_\_\_\_\_

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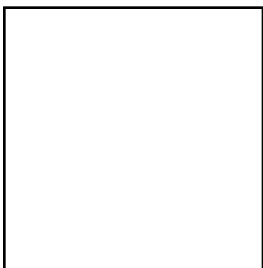
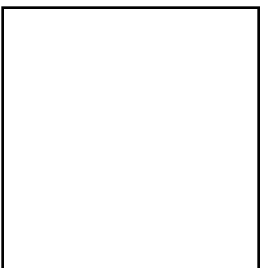
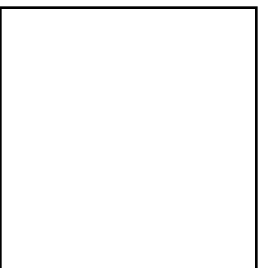

2. Slide the slider with the red dot to the first point and use the focus (green dot slider) to make the view clearer. Draw what you see at each magnification (listed in the green area under the specimen's name.)

|  |  |   |  |
|--|--|---|--|
|  |  |  |  |
| x 1000   | x 5000   | x 10,000  | x 30,000   |

3. Choose another item to view. Write a description of the item and draw what you see at each magnification.

Item: \_\_\_\_\_

Description:

|   |   |  |   |
|---|---|--|---|
|  |  |  |  |
| 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!**