

AT HOME

Microscopes Online

Name _____

Go to the *Cells & Microscopes* page of the *Kid Zone* at <http://sciencespot.net/> to find the links below.

Site #1: A-Z Microscope History

1. Who was the first man to make and use a microscope? _____
2. What was his microscope called? _____
3. How many microscopes did he create in his lifetime? _____
4. How can you change the power of a single-lens microscope? _____
5. How was the first compound microscope different from Leeuwenhoek's microscope? _____

6. Where are the two lenses located in a compound microscope used in most classrooms today? _____

7. What did each of the following scientists discover by using a compound microscope?
Robert Hooke - _____
Louis Pasteur - _____
Robert Koch - _____

Site #2: Microbus - Go to the "*History of the Microscope*" section.

1. What did the Romans discover as they experimented with different shapes of clear glass lenses? _____

2. What were early lenses called besides magnifiers? Why? _____

3. Describe the compound microscope developed by Zaccharias and Hans Janssen. _____

4. What did Galileo contribute to the field of microscopy? _____

5. Who is known as the "Father of Microscopy"? _____

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Site #3: What in the World - Mystery Photos (from National Geographic)

Try at least four different challenges in the "What in the World" section and record your results in the chart. You will need to fill in the chart with the title of the game and the name of the four objects shown in the pictures.

Title of Game	Objects Identified			
	1. _____	2. _____	3. _____	4. _____
	1. _____	2. _____	3. _____	4. _____
	1. _____	2. _____	3. _____	4. _____
	1. _____	2. _____	3. _____	4. _____

SITE #4 : 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 about the image as you increase the magnification? _____

SITE #5: Powers of Ten

If you need to stop the Powers of Ten display, click the Auto/Manual button under the picture to display arrows that will allow you to go back to the first slide or move ahead.

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.

Done with your worksheet?

Go to the Pfizer's Fun Zone and try the "Scrambler"

OR

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

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.

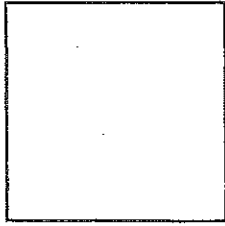
___ SEM samples are coated with a very thin layer of gold by a machine called a sputter coater.

6. Watch the animation if possible.

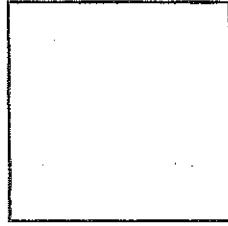
AT HOME

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

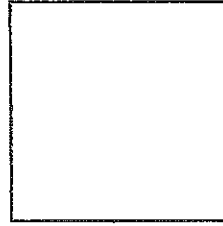
1. What is E.Coli? _____
2. Slide the slider with the red dot to the different red marks to change magnification and use the focus (green dot slider) to make the view clearer. Draw what you see at each magnification (listed in the green area under the specimen's name.)



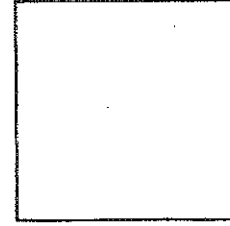
x 1000



x 5000



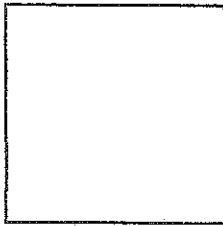
x 10,000



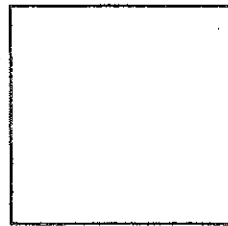
x 30,000

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.)

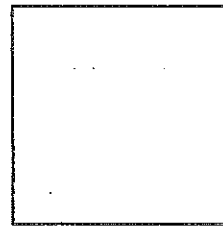
Item _____



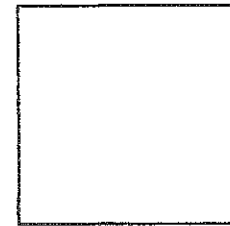
x _____



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!