

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Period: \_\_\_\_\_

## Microscope Worksheet

### I. How Can a Microscope Help Us Study Living Things?

Microscope: an instrument that makes things look bigger

Biology: the study of living things.

Some living things are so small we can't see them with the naked eye alone. Many of these are one celled organisms called PROTOZOA [pro tuh ZO uh] and BACTERIA.

We can see such tiny things with the help of a high-power microscope. A microscope magnifies, or makes things look bigger.

Have you ever used a magnifying glass? It is a *simple* microscope.

A magnifying glass, or hand lens, is easy to use. It doesn't weigh much, and it's easy to carry. But it doesn't magnify objects very much. We still cannot see one-celled plants and animals with a hand lens.

A *compound* microscope is much more powerful than a simple microscope. Most school microscopes are compound microscope. They can make objects look 100 to 400 times as big as they really are. Some compound microscopes magnify more than a thousand times. When we say "microscope," we usually mean a compound microscope.

The microscope has many uses, especially in biology – the study of living things.

Doctors often use microscopes. Is there one in your doctor's office?

### Parts of the Microscope

**Eyepiece:** Lens closes to the eye.

**High Power Objective:** Longer of the two lenses close to the slide.

**Lower Power Objective:** Shorter of the two lenses close to the slide.

**Tube:** Gives the distance needed between the eyepiece and objective.

**Coarse Adjustment Knob:** Moves the tube up and down.

**Fine Adjustment Knob:** Also moves the tube up and down but only slightly.

**Base:** Holds up the entire microscope.

**Arm:** Holds the tube and lenses. Connects to the base.

**Nosepiece:** Holds objective lenses.

**Light:** Shines light into the tube.

**Diaphragm:** Circular disk that lets more or less light pass through.

**Stage:** Platform for slide to rest. An opening in its center lets light pass through.

**Clips(2):** Hold the slide in place on the stage.

### II. How Does a Microscope Magnify?

There are three lenses in the microscope. The top lens is called the eyepiece. It is the lens closest to the eye. The other two lenses are called objectives. These are the lenses closest to the object. The object is on a microscope slide. Different lenses magnify in different powers. The power of magnification is marked by a number with an x next to it. A lens that magnifies ten times is marked 10x.

Eyepiece	Objective Lens	Magnification
10x	10x	100x
10x	40x	
10x	44x	
5x	10x	
5x	40x	
20x	10x	

If the eyepiece is marked 10x and the objective 10x, then the total magnification is 100x. To find the total magnification of a microscope, just multiply the two magnifications. Complete the table below by finding the total magnification for each pair of lenses.

**III. Handling Microscope.** A microscope is a delicate instrument. Treat it carefully.

1. A student in the figure below is holding the microscope properly. Can you describe the right way to hold a microscope?

\_\_\_\_\_

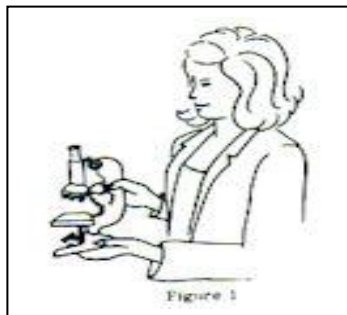
\_\_\_\_\_

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2. The boy is wondering what to use to clean the microscope lenses. The lens tissue has been treated to prevent scratching. What should one use to clean? \_\_\_\_\_ Why? \_\_\_\_\_

3. The girl is focusing a slide and she is moving the stage up toward the slide.

a) What has happened to the slide?

\_\_\_\_\_

b) Is this the proper way to focus?

\_\_\_\_\_

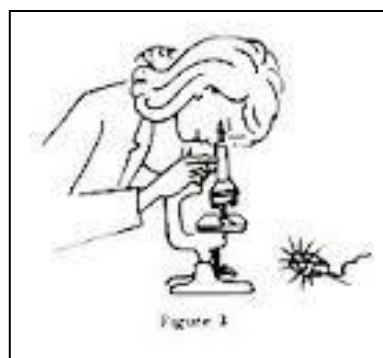
c) Should you focus by moving stage up or down?

\_\_\_\_\_

d) What happens to a microscope if placed at the edge?

\_\_\_\_\_

e) What should you do to prevent this from happening.



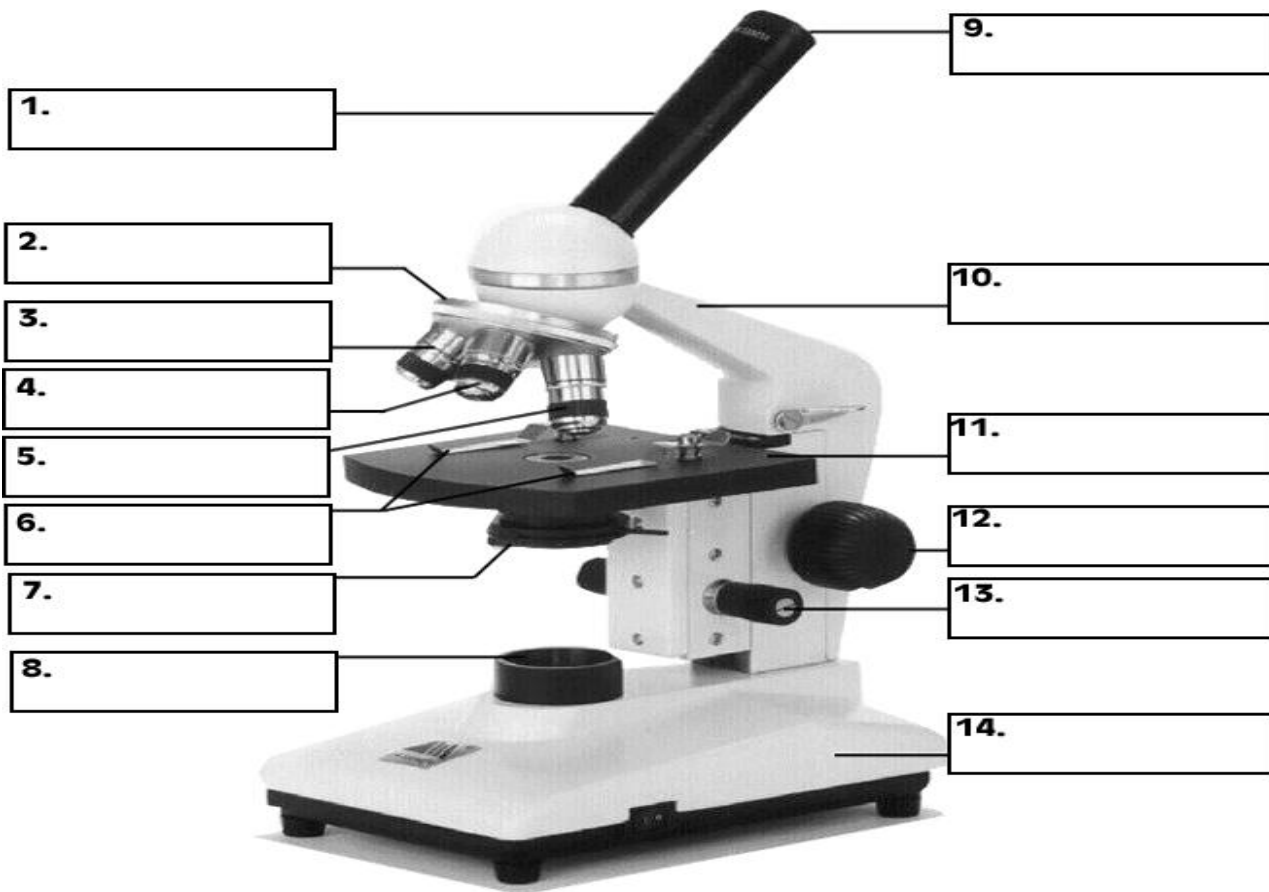
**VI. Matching.** Match the two lists. Write the correct letter on the line next to each number.

- |                              |                               |
|------------------------------|-------------------------------|
| 1. _____ simple microscope   | a) support entire microscope. |
| 2. _____ base                | b) has one lens only.         |
| 3. _____ compound microscope | c) study of living things.    |
| 4. _____ eyepiece            | d) has more than one lens.    |
| 5. _____ biology             | e) lens closest to the eye.   |

**VII. True or false.** Write T on the line next to the number if the sentence is true. Write F if the sentence is false.

1. \_\_\_\_\_ A microscope makes things bigger. (Careful, this is tricky!)
2. \_\_\_\_\_ A microscope can have one lens.
3. \_\_\_\_\_ Compound microscopes are used on nature walks.
4. \_\_\_\_\_ A compound microscope magnifies more than a simple microscope does.
5. \_\_\_\_\_ Light enters the eyepiece first.
6. \_\_\_\_\_ A microscope stage must have an opening.
7. \_\_\_\_\_ When you carry a microscope, you should hold it by the tube.
8. \_\_\_\_\_ Focusing upward can crack a slide.
9. \_\_\_\_\_ You should use only lens tissue to clean a microscope lens.

VIII. **Find the Parts.** Write the name of the microscope part next to the correct line in the picture.



**Microscope Use:**

- 15. When focusing a specimen, you should always start with the \_\_\_\_\_ objective.
- 16. When using the high power objective, only the \_\_\_\_\_ knob should be used.
- 17. The type of microscope used in most science classes is the \_\_\_\_\_ microscope.
- 18. You should carry the microscope by the \_\_\_\_\_ and the \_\_\_\_\_.
- 19. The objectives are attached to what part of the microscope (it can be rotated to click lenses into place?) \_\_\_\_\_
- 20. A microscope has an ocular objective of 10x and a high power objective of 50x, what is the microscope's total magnification? \_\_\_\_\_