

Write one important fact from each paragraph in this space.

## Science Shorts -7

### All About Microscopes

All living things are made up of cells. Some organisms, such as bacteria, are made up of only one cell. They are much too small to be seen with the naked eye alone. These organisms are called microorganisms.

How can we see and study such tiny organisms or the single cells of a many-celled organism? We can use a microscope. A microscope is an instrument that makes objects appear larger by bending light that comes through the lens. Anton van Leuwenhoek improved the lens of the first microscopes. When he did that he saw tiny animals swimming in a drop of water. He wrote many papers about what he observed and has since been called the "Father of Microscopy."

Have you ever used a hand lens? A hand lens is a simple microscope. A simple microscope has only one lens. A hand lens is easy to use. It is small and does not weigh very much. But a hand lens does not magnify objects very much. We cannot see one-celled organisms with a hand lens.

A compound microscope is much more powerful than a simple microscope. A compound microscope has two sets of lenses. Most school microscopes are compound microscopes. Most compound microscopes can make objects appear 100 to 400 times larger than they really are. Some microscopes can magnify objects as much as 1000 times. When we talk about a microscope, we usually mean a compound microscope.

Another kind of microscope is the electron microscope. Electron microscopes can magnify objects up to 300,000 times. These microscopes are found in scientific laboratories and are about the size of a large desk.

Some things are transparent. You can see right through them. Glass is transparent. So are water and air. A transparent object lets light pass right through it. Some cells and cell organelles are transparent. This makes these parts hard to see under a microscope. How do scientists study such cells? They use a stain.

A stain is a dye. It adds color to the specimen on the slide. This makes the specimen easier to see. There are many different kinds of stain. Not all cells and cell organelles absorb, to take in, the same kind of stain. In addition, some organelles of a cell may take in different amounts of stain. This means that some structures may be darker (or lighter) than others. The kind of stain used on a slide depends on what is being studied.

In the space provided, write “true” if the sentence is true. Write “false” if the sentence is false.

- \_\_\_\_\_ 1. A microscope can have one lens.
- \_\_\_\_\_ 2. A transparent object blocks light.
- \_\_\_\_\_ 3. A compound microscope magnifies more than a simple microscope does.
- \_\_\_\_\_ 4. A hand lens is a simple microscope
- \_\_\_\_\_ 5. Any kind of stain will work for any cell.
- \_\_\_\_\_ 6. One-celled organisms are easy to see with a microscope.
- \_\_\_\_\_ 7. Electron microscopes are found in scientific laboratories
- \_\_\_\_\_ 8. A compound microscope has two sets of lenses.



vanLeewenhoek's  
microscope



compound  
microscope



electron  
microscope

Match each term in Column A with its description in Column B. Write the correct letter in the space provided.

**Column A**

- \_\_\_\_\_ 1. simple microscope
- \_\_\_\_\_ 2. stain
- \_\_\_\_\_ 3. compound microscope
- \_\_\_\_\_ 4. Anton van Leuwenhoek
- \_\_\_\_\_ 5. transparent

**Column B**

- a) Father of Microscopy
- b) has only one lens
- c) allows light to pass through
- d) has more than one lens
- e) a dye used on cells