

# Microscopes

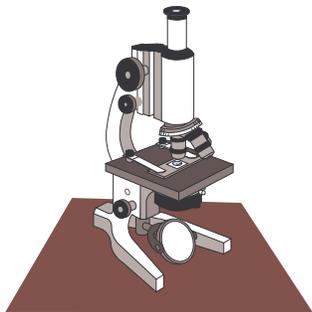


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# Microscope Homework

**BRING IN OBJECTS TO EXPERIMENT WITH TOMORROW!**

**Directions:** Find two objects to use tomorrow. Each object you decide to use **cannot** be:

- dangerous or forbidden at school
- more than two inches tall

For each object, write what the object is, what it looks like and what you think it will look like when magnified.

My first object is \_\_\_\_\_ .

Description: \_\_\_\_\_

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Hypothesis: \_\_\_\_\_

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My second object is \_\_\_\_\_ .

Description: \_\_\_\_\_

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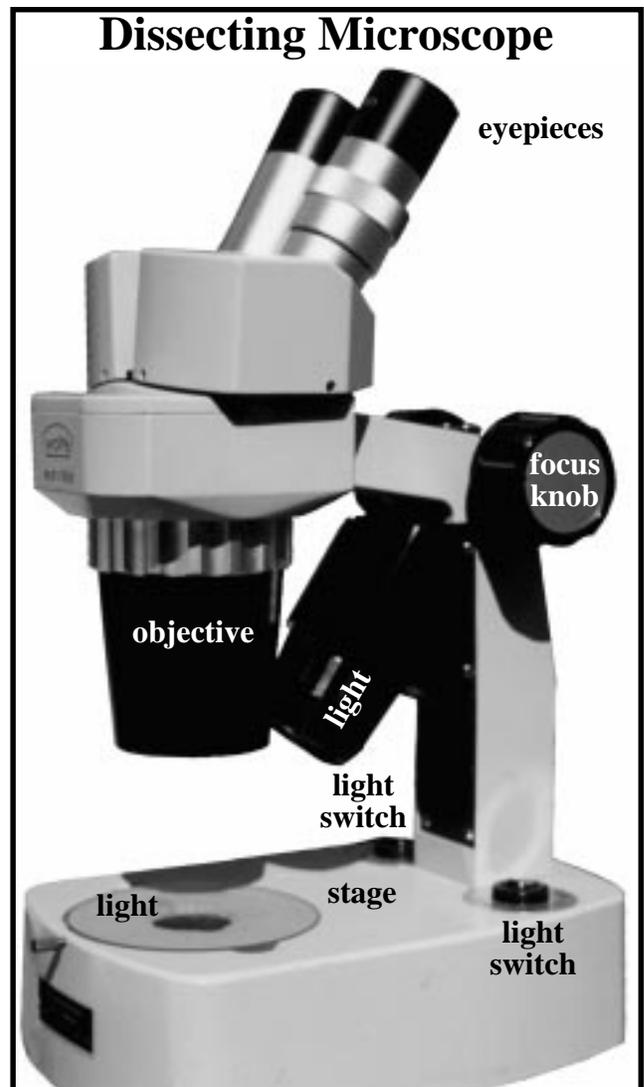
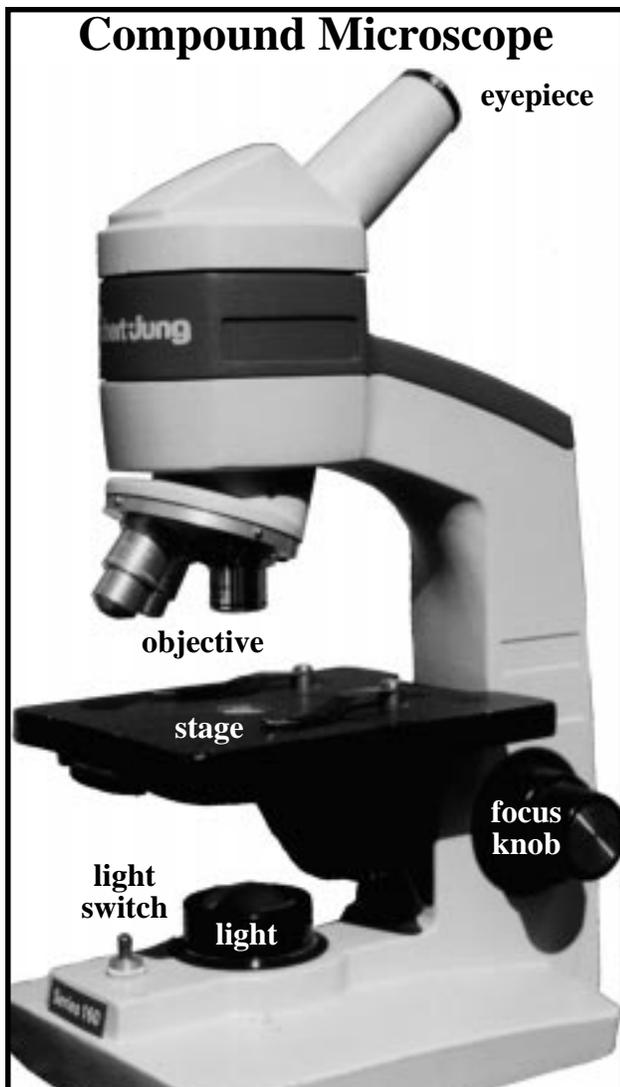
Hypothesis: \_\_\_\_\_

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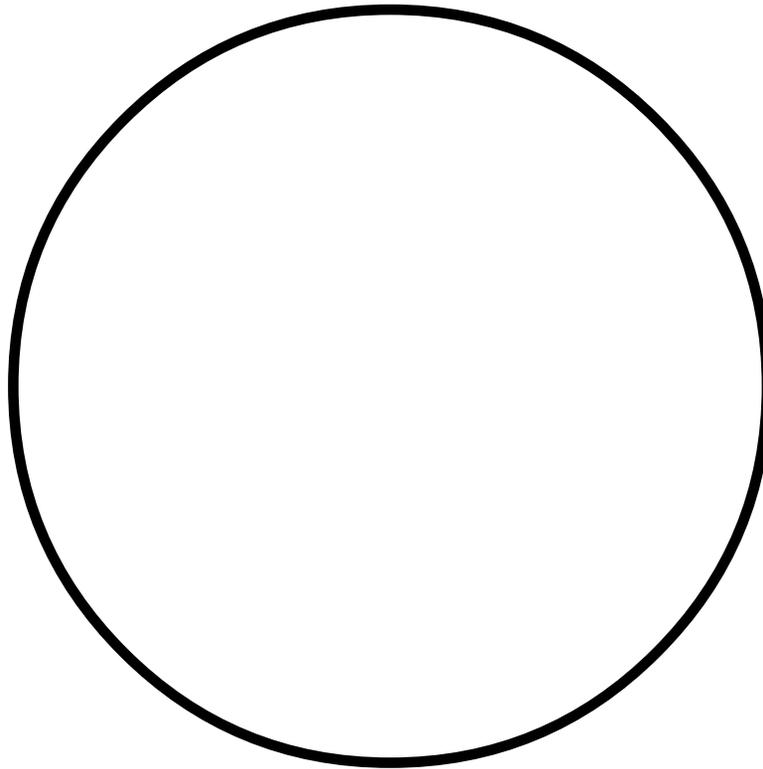
# Microscopes

## HOW DO DIFFERENT OBJECTS LOOK WHEN MAGNIFIED?

1. Choose an object to look at with a microscope.
2. There are two different types of microscopes that you can use. Which type should you use with your object? In general, you should use:
  - A **Compound Microscope** if your object is **very thin** and **you can see through it** (things like strands of hair, glass slides or blades of grass)
  - A **Dissecting Microscope** if your object is **big** or if **you can't see through it** (things like rocks, baseball cards or your hand)
3. Put your object on the microscope's **stage** and look through the **eyepiece(s)**. Does it look fuzzy? Try turning the **focus knob**. Is it really dark? Make certain that the microscope's **lights** are on. Try experimenting with different magnifications.
4. Draw what your object looks like on **Microscope Data Sheet**.



# Microscope Data Sheet



**Object:** \_\_\_\_\_ **Magnification:** \_\_\_\_\_

**Description:** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

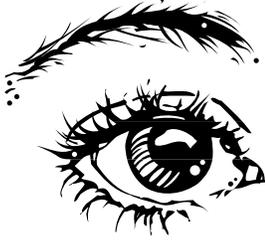
1. When observing your object under the microscope, what are its most interesting or unusual features?

2. What did you discover about your object using the microscope?

# Instruments Used for Scientific Observations

Label the instrument

Name an object that can be seen with each instrument.



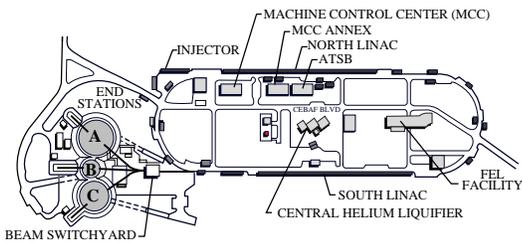
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1. What is the relationship between the instruments and the size of the objects that can be seen with them?

# Reading About Microscopes

## YOU USED MICROSCOPES IN THE CLASSROOM AT JEFFERSON LAB.

**Directions:** Read the following passage. Fill in the blanks with words that make sense. Remember to use context clues that come before and after the blanks.

It happened over 300 years 1 in Holland. Anton van Leeuwenhoek (AN-tun van LAY-vun-hook) had a new microscope that he had 2. One day he 3 through it at a drop of lake water. What he saw surprised him.

The water was alive with what Leeuwenhoek called "wee beasties." The microscope made tiny organisms look 200 times 4 than life size. Leeuwenhoek was one of the first scientists to see living things that were that 5. His work was a giant 6 for science.

Today, microscopes are much stronger. An electron microscope can make tiny organisms look 200,000 times 7 size. A few electron microscopes can see individual atoms. Pictures can be made to show the objects or organisms much bigger. The pictures add greatly to what we know about tiny objects and 8. Microscopes have come a long way in 300 years!

**Directions:** Choose the word that fits the context of the passage.

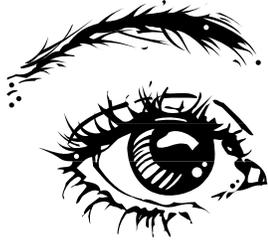
- |    |              |            |                |                |
|----|--------------|------------|----------------|----------------|
| 1. | a. since     | b. ago     | c. before      | d. after       |
| 2. | a. made      | b. lost    | c. previewed   | d. delivered   |
| 3. | a. fell      | b. broke   | c. looked      | d. went        |
| 4. | a. farther   | b. smaller | c. darker      | d. larger      |
| 5. | a. life      | b. small   | c. darker      | d. larger      |
| 6. | a. turtle    | b. gorilla | c. step        | d. tower       |
| 7. | a. small     | b. over    | c. under       | d. life        |
| 8. | a. organisms | b. gravity | c. electricity | d. microscopes |



# Instruments Used for Scientific Observations

Label the instrument

Name an object that can be seen with each instrument.



***human eye***

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***people, houses, etc...***

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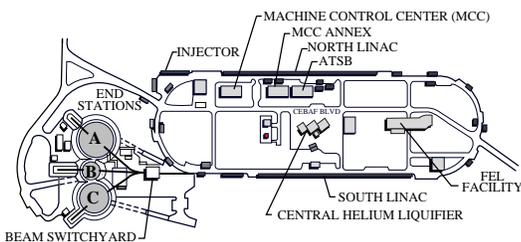


***microscope***

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***cells, bacteria, etc...***

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***particle accelerator***

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***atoms, quarks, etc...***

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1. What is the relationship between the instruments and the size of the objects that can be seen with them?

***The larger the instrument, the smaller the observed object.***

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- |    |                     |                 |                  |                  |
|----|---------------------|-----------------|------------------|------------------|
| 1. | a. since            | <b>b. ago</b>   | c. before        | d. after         |
| 2. | <b>a. made</b>      | b. lost         | c. previewed     | d. delivered     |
| 3. | a. fell             | b. broke        | <b>c. looked</b> | d. went          |
| 4. | a. farther          | b. smaller      | c. darker        | <b>d. larger</b> |
| 5. | a. life             | <b>b. small</b> | c. darker        | d. larger        |
| 6. | a. turtle           | b. gorilla      | <b>c. step</b>   | d. tower         |
| 7. | a. small            | b. over         | c. under         | <b>d. life</b>   |
| 8. | <b>a. organisms</b> | b. gravity      | c. electricity   | d. microscopes   |

# Microscopes

This is an activity in which students observe objects with a microscope.

## Objectives:

In this activity students will:

- choose two objects from home to observe with a microscope
- describe what each object looks like to the unaided eye
- form a hypothesis for each object explaining what they think the objects will look like when
- learn how to use two different types of microscopes
- record their observations by sketching what they see
- calculate the magnification used to view an object

## Questions to Ask:

1. Did the objects look like you thought they would when magnified?
2. How do smooth objects, like paper, look when magnified?
3. What most surprised you when using the microscopes?

## Travel Book Activities:

- Reading About Microscopes
- Writing About Size
- Microscope Homework

## Virginia State Standards of Learning

### Science 6.1 Plan and Conduct Investigations

- by making observations involving fine discrimination between similar objects and organisms
- by recording precise and approximate measurements
- by communicating visual data through graphical representation (diagram)

# Microscopes

## Teacher Overview and Materials List

### Background:

With the invention of the microscope, scientist could see things they never could before. They discovered that we were surrounded by strange creatures that were too small to see. In this activity, students will discover new things about ordinary objects.

### Minimum Materials Needed for Each Student Group:

Objects to observe

Compound microscopes

Dissecting microscopes

### Pre-Activity Preparations:

#### The Homework

1. Have the students select two objects to bring in from home.
2. Have the students complete the homework page for their two objects.



Materials for Microscopes