

MICROSCOPE CARE AND USE

Always use *two hands* to carry a microscope—one hand holding the neck and one supporting the microscope from below. If the microscope has a built-in light, *gather up the power cord* to keep it from getting underfoot.

Water and *dust* are the two main enemies of a microscope. Be sure to *wipe up any water* that falls on the scope, and always *cover microscopes with a dust cover* when they are not in use.

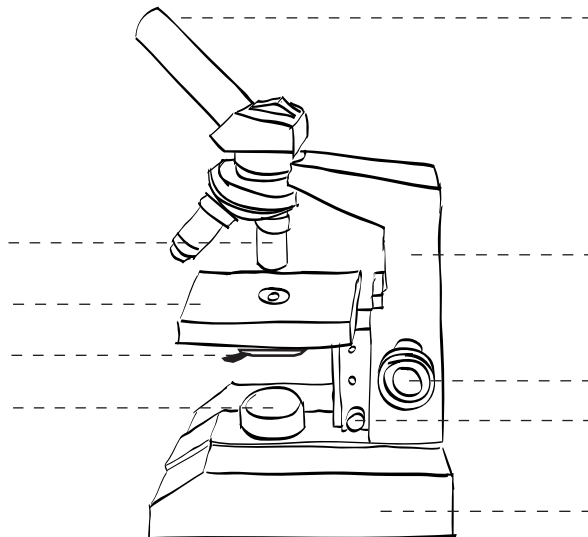
Never use tissue or a paper towel to clean a microscope lens. Even though they feel soft, they can scratch the lenses. Use *lens paper only* to clean the lenses.

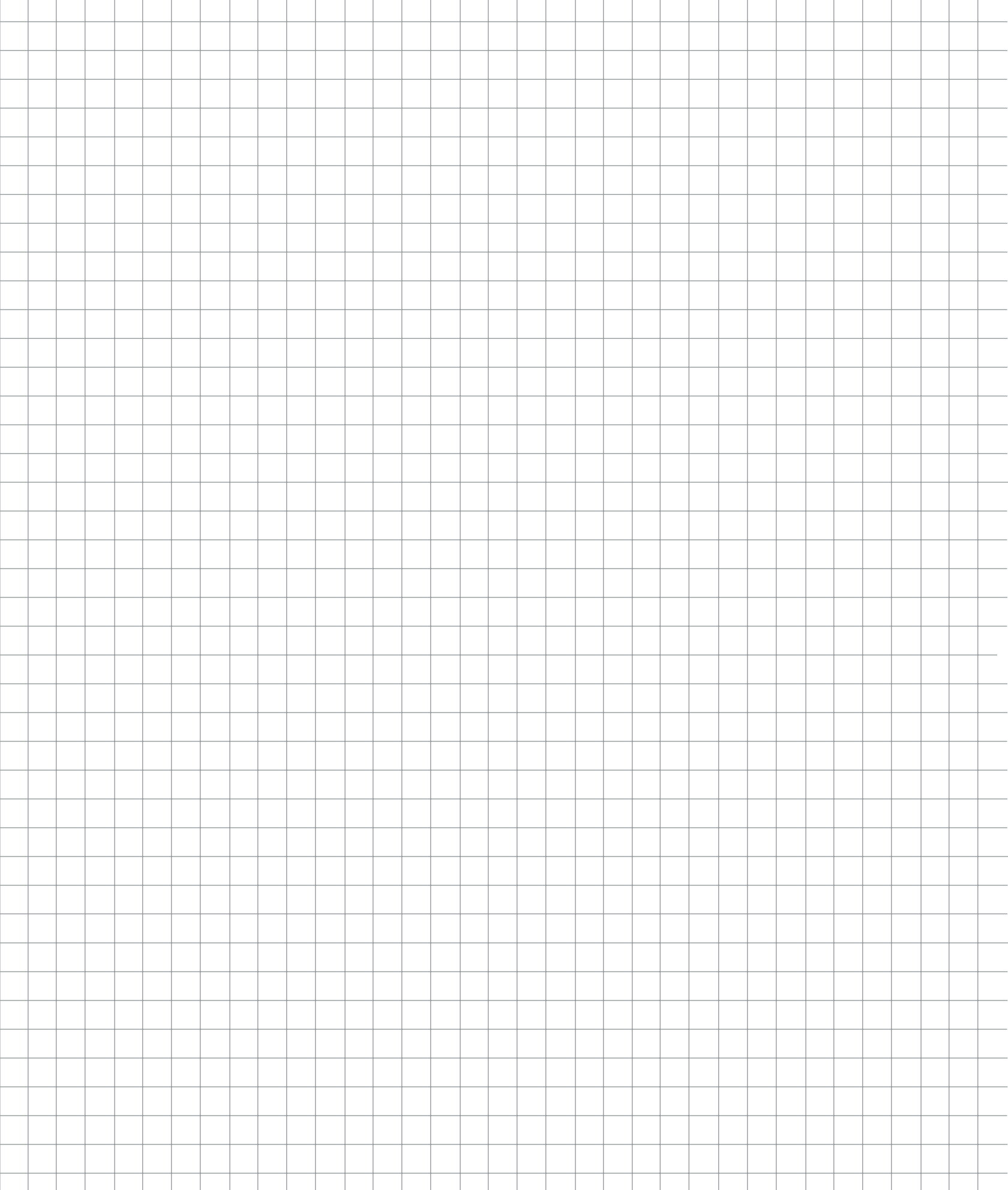
When first examining an object, **start with the lowest power objective lens** (the lens with the smallest number on it). Use the **coarse adjustment knob** to bring the objective lens close to the slide. *Do not look through the lens at this time.* Check the distance between the objective lens and the slide carefully while bringing the objective lens close to the slide. *The lens should never touch the slide.*

Look through the **eyepiece**. Use the coarse adjustment to bring the object into focus. *Always* turn the coarse focus knob so the objective lens moves **away from the stage**, so that you will not break the slide or damage the lens. *Never* use the coarse adjustment to *focus closer to the object* while looking through the eyepiece. Adjust the amount of light coming to the object with the **diaphragm located under the stage**.

Once you have the object in focus, to increase the magnification **rotate the objective lens to a higher power** and use the **fine adjustment to focus** the object.

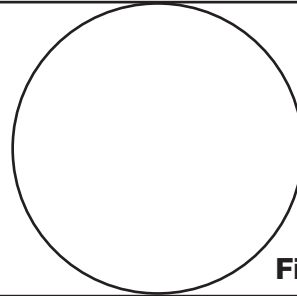
Label the parts of the microscope.



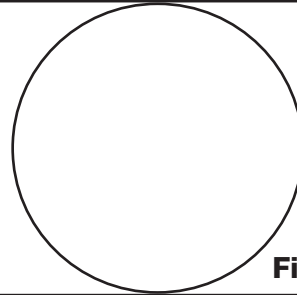


MICROSCOPE IMAGES**1. Draw the letter e.**

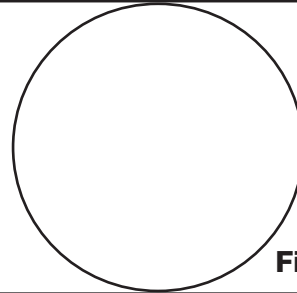
- Set the objective lens to 4x.
- Place the dry-mount slide of the letter e on the stage of the microscope.
- Center the image and draw *exactly* what you see.

**Field of view****2. Move the slide away from you.**

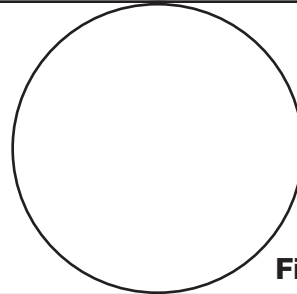
- Move the slide away from you.
- What direction did the image move? _____
- Draw an arrow in the circle to indicate the direction the image moved.

**Field of view****3. Move the slide to the right.**

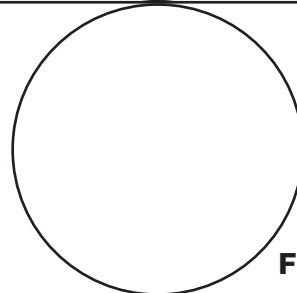
- Move the slide to your right.
- What direction did the image move? _____
- Draw an arrow in the circle to indicate the direction the image moved.

**Field of view****4. Observe the color photograph.**

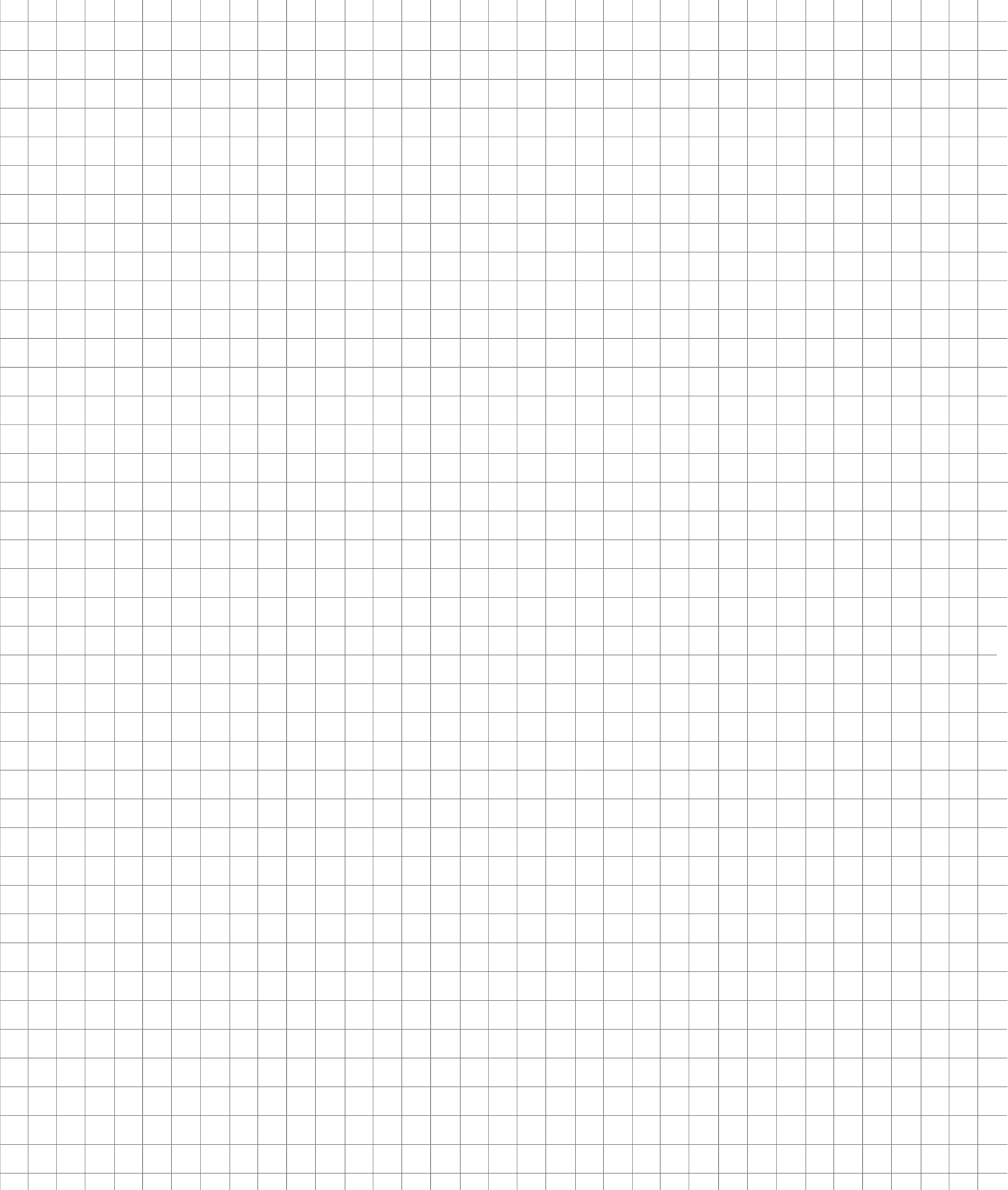
- Make a dry mount of a piece of colored photo.
- Draw and color what you see.
- Compare the colors you see with and without the microscope.

**Field of view****5. Observe the feather.**

- Prepare a dry mount of the feather. Use a second slide as a coverslip.
- View the feather tip using the 10x objective.
- Draw what you observe.

**Field of view****6. Answer these questions on page 8 or on a blank sheet of paper.**

- Is the image seen through the microscope oriented the same way as the object on the stage of the microscope? Explain.
- If you want to move the image to the right, which way should you move the slide?
- If you want to move the image up, which way should you move the slide?



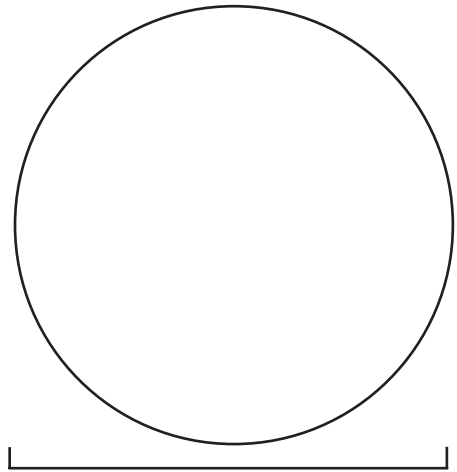
FIELD OF VIEW AND MAGNIFICATION

The width of one square in the nylon netting material (measured with the millimeter ruler) is _____.

Part 1: The 4x objective

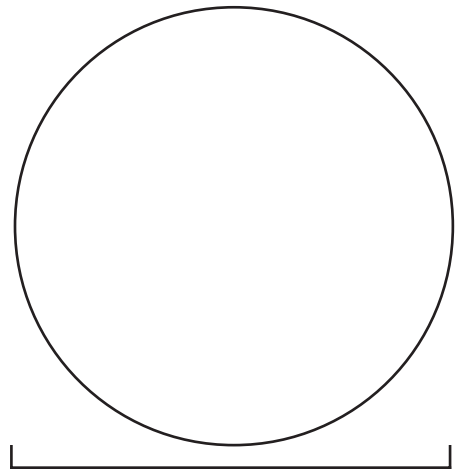
- Place the netting and ruler slide on the stage of the microscope. Select the 4x objective.
- Draw exactly what you see in the field of view.
 - What is the width of the field of view? _____
 - What is the width of one mesh square? _____
 - What is the total magnification with this objective lens? _____
- Mark 1 mm on the scale below the field of view.

Field of view



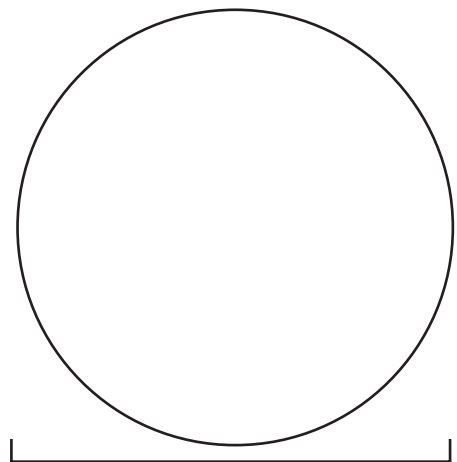
Part 2: The 10x objective

- Select the 10x objective.
- Draw exactly what you see in the field of view.
 - What is the width of the field of view? _____
 - Estimate the width of one mesh square to the nearest 0.1 mm. _____
 - What is the total magnification with this objective lens? _____
- Mark 1 mm on the scale below the field of view.



Part 3: The 40x objective

- Select the 40x objective.
- Draw exactly what you see in the field of view.
 - What is the width of the field of view? _____
 - Estimate the width of one mesh square to the nearest 0.1 mm. _____
 - What is the total magnification with this objective lens? _____
- Mark 1 mm on the scale below the field of view.

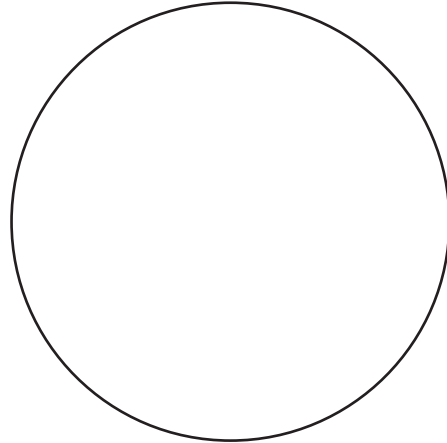


FOCAL PLANE

Part 1: Focus on layers of ribbon

1. Make a wet mount of three layers of ribbon.
2. Set the objective lens for 100x magnification.
3. Focus on the top layer of ribbon. Then use the fine focus to focus down through the layers.
 - How many layers can you get into focus at one time? _____
 - Which direction do you turn the right-hand fine focus to focus *down* through the layers? _____
 - Use colored pencils to draw *exactly* what you see when the *middle* layer is in focus.

Field of view



Part 2: Mystery ribbons

Our slide

Top
2
3

1. Make a wet mount of *three* layers of ribbon. Keep the order a secret. Record the order of ribbons, top to bottom, on the lines to the left under the heading "Our slide." ←
2. Trade mystery-ribbon slides with another team.
3. Use your microscope to determine the order of the colored ribbons used to make the mystery-ribbon slide. Record the colors and the order to the right under the heading "Mystery slide." →

Mystery slide

Top
2
3

Questions

1. How did you figure out which ribbon was on the bottom?

2. Why can't you get all three layers of ribbon in focus at the same time?

3. What is "focal plane"?

