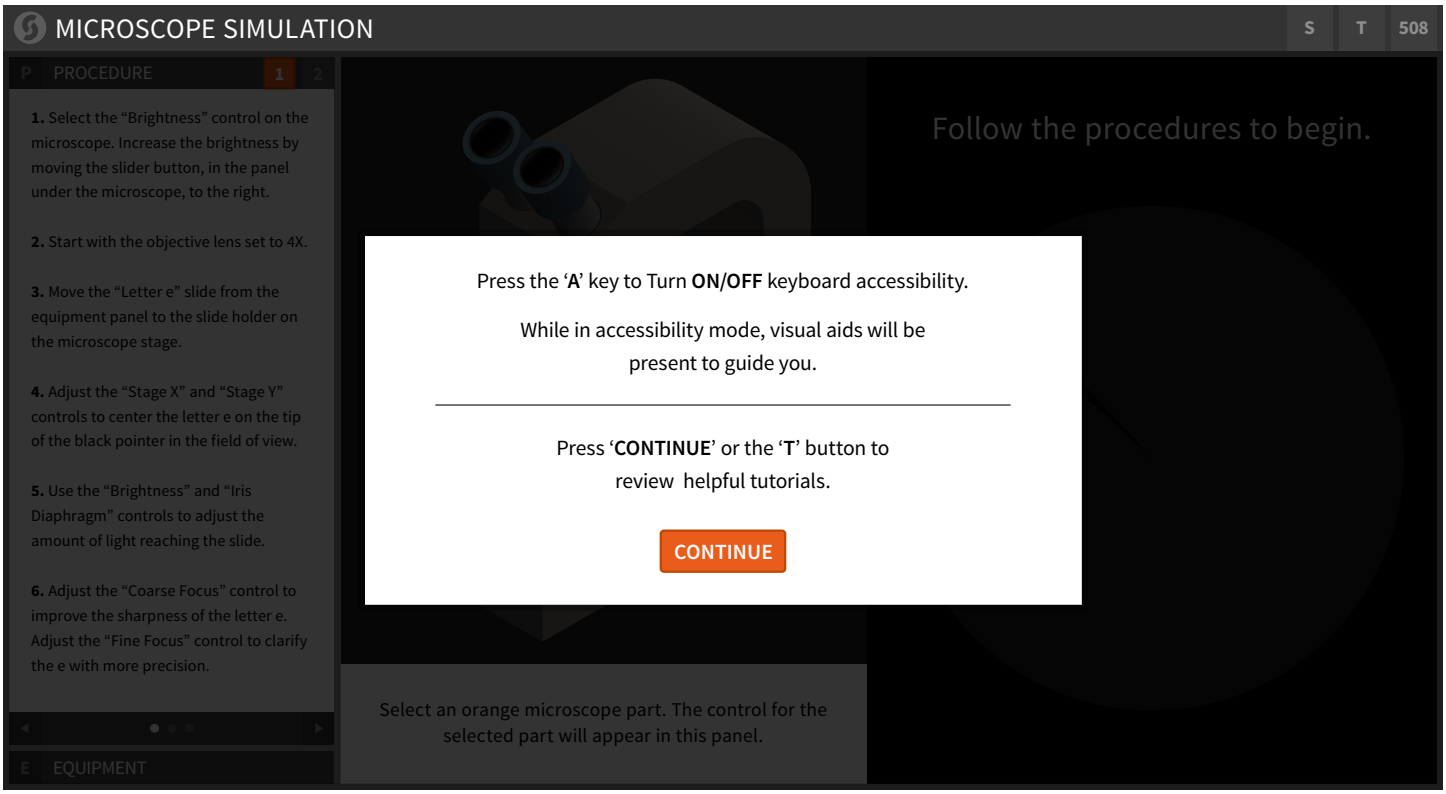



Screen 1

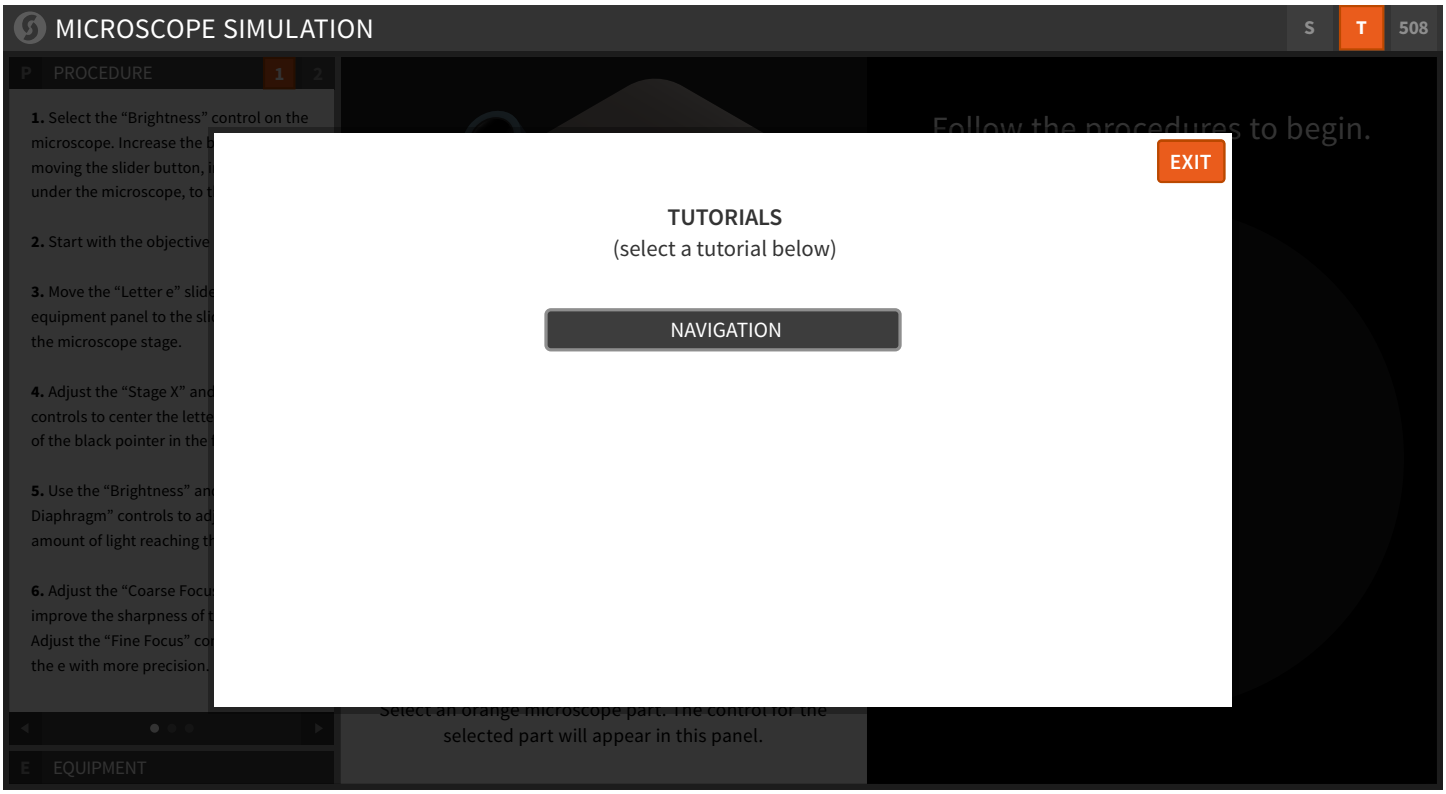
This document will cover both the "Microscope Simulation" and "Bacterial Morphology" labs.

The lab will begin with the default opening screen:

"Press the 'A' key to Turn ON/OFF keyboard accessibility.

While in accessibility mode, visual aids will be present to guide the user.

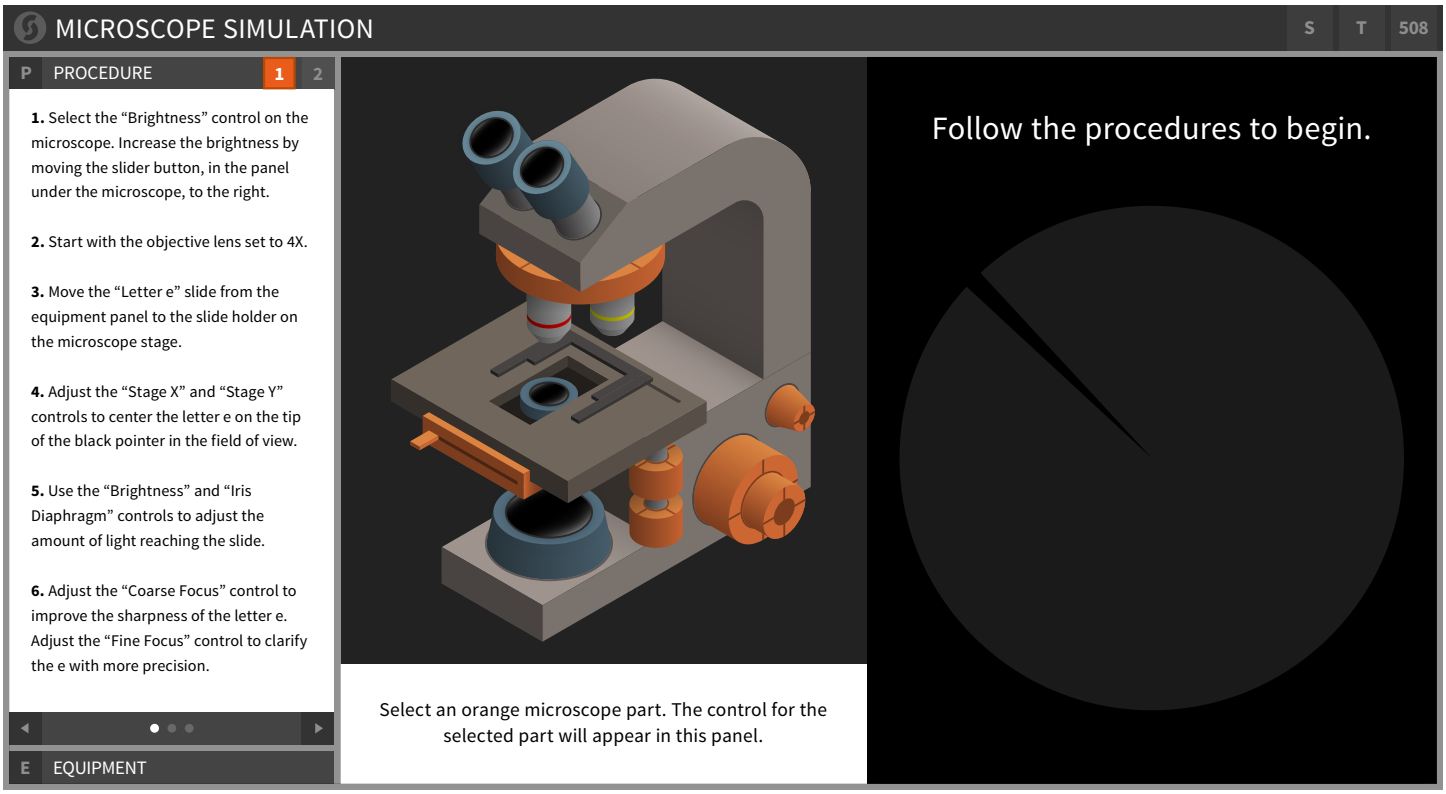
Press 'CONTINUE' or the 'T' button to review helpful tutorials. "




Screen 2

When 'CONTINUE' is pressed on the opening page, the "Tutorials" page will open.

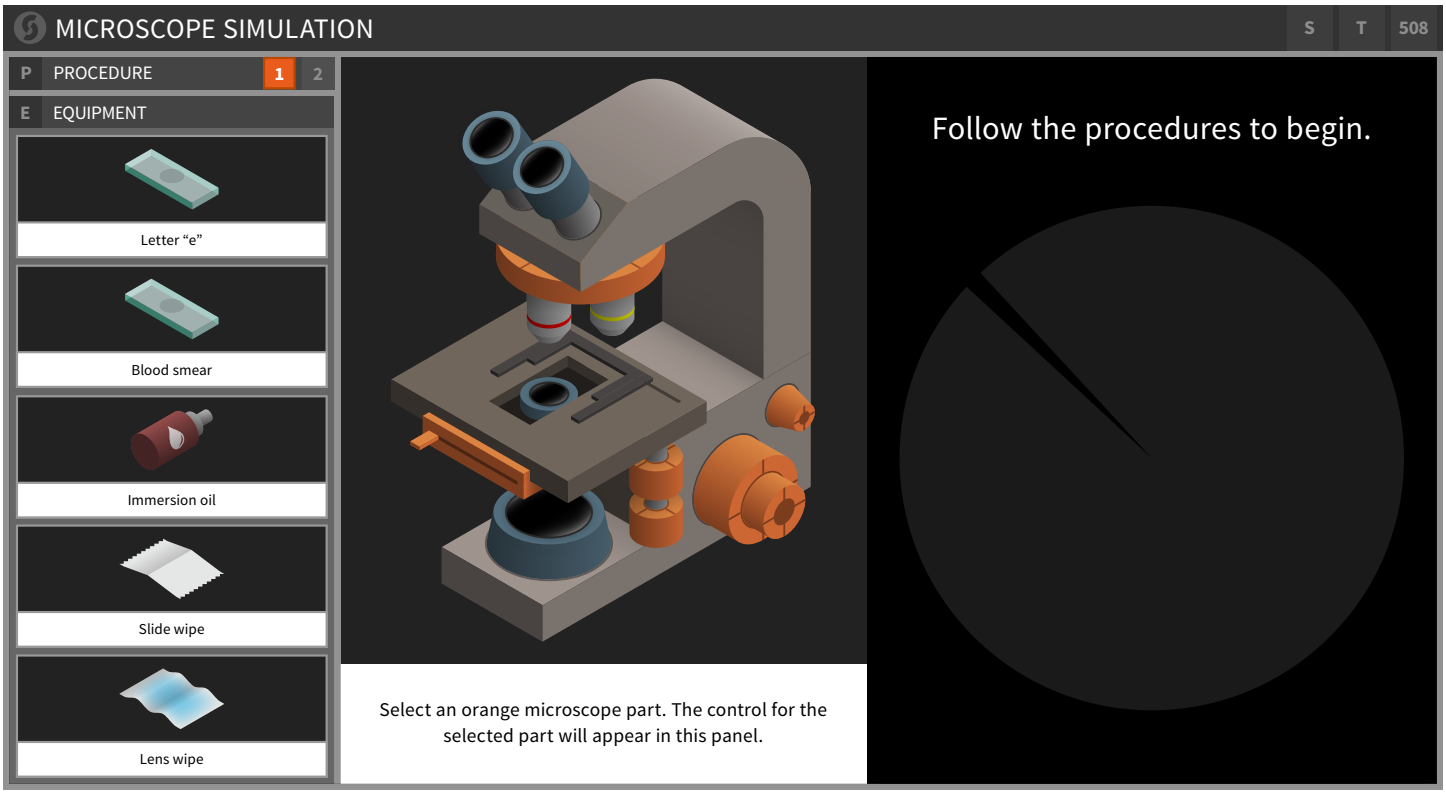
The only tutorial available for this lab will be the navigation tutorial and is standard for all our newer Flash labs. The navigation tutorial won't be covered in this document but will be a part of both microscope labs.




Screen 3

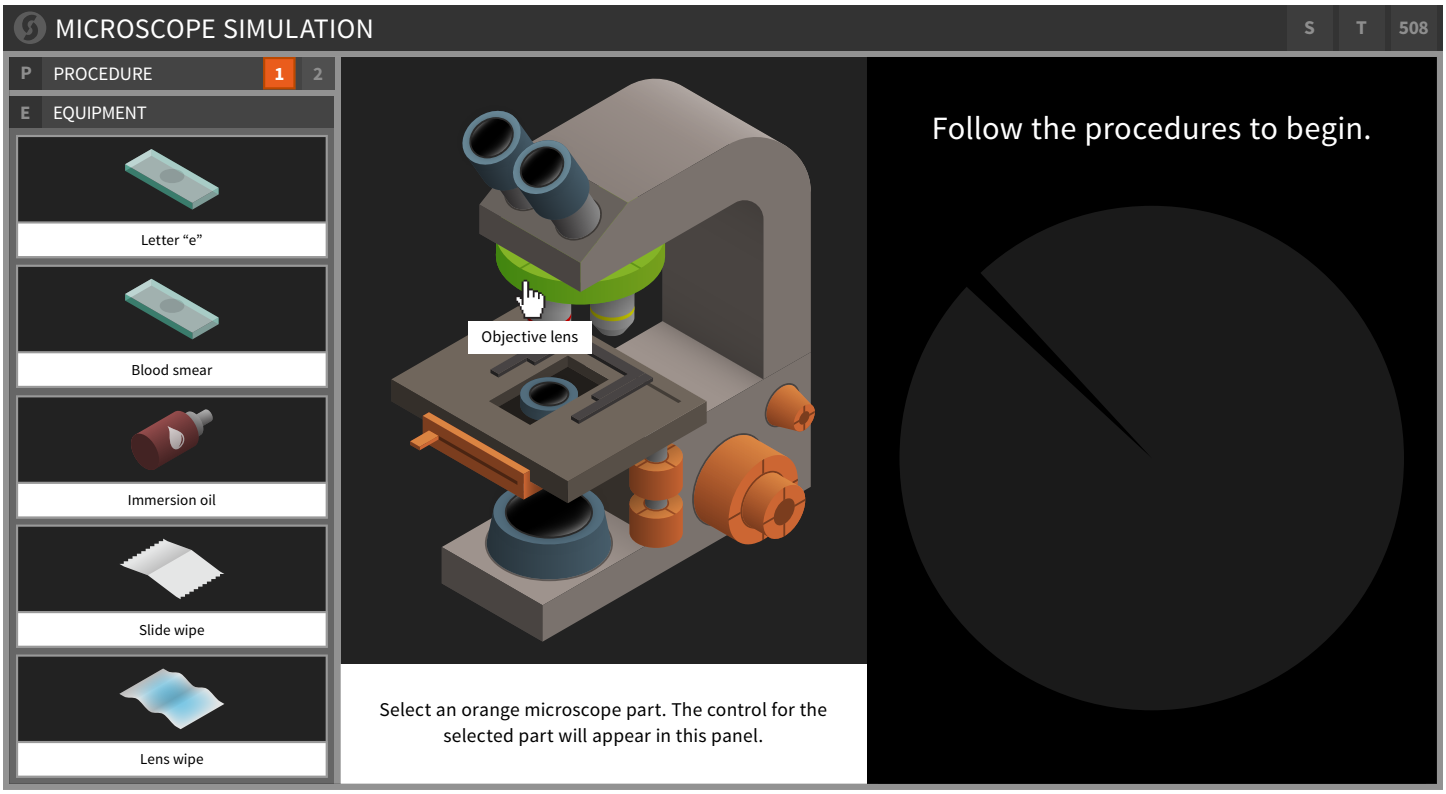
The lab will begin with Procedure 1 open.

This message on the right, “Follow the procedures to begin.” will only be seen at the beginning of the lab, and will change when a slide is placed on the microscope stage.




Screen 4

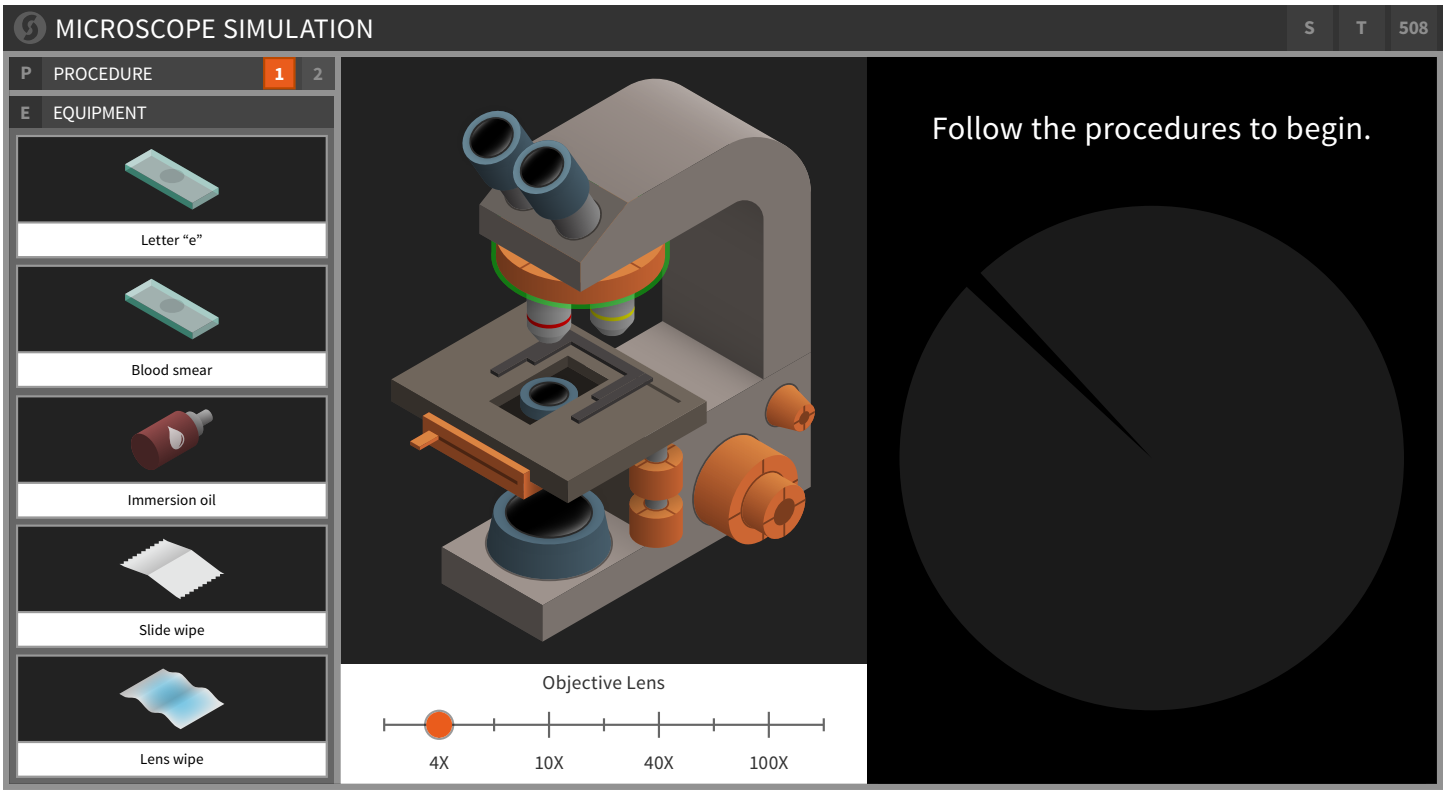
The open equipment panel.




Screen 5

This message under the microscope will only show at the beginning of the lab, “Select an orange microscope part. The control for the selected part will appear in this panel.” It will be replaced when the first microscope controller part is selected.

When the user rolls over an orange microscope part, it will have a green overlay on the part and a hint telling the user the part name. In this case, the cursor is hovering over the “Objective Lens” control.

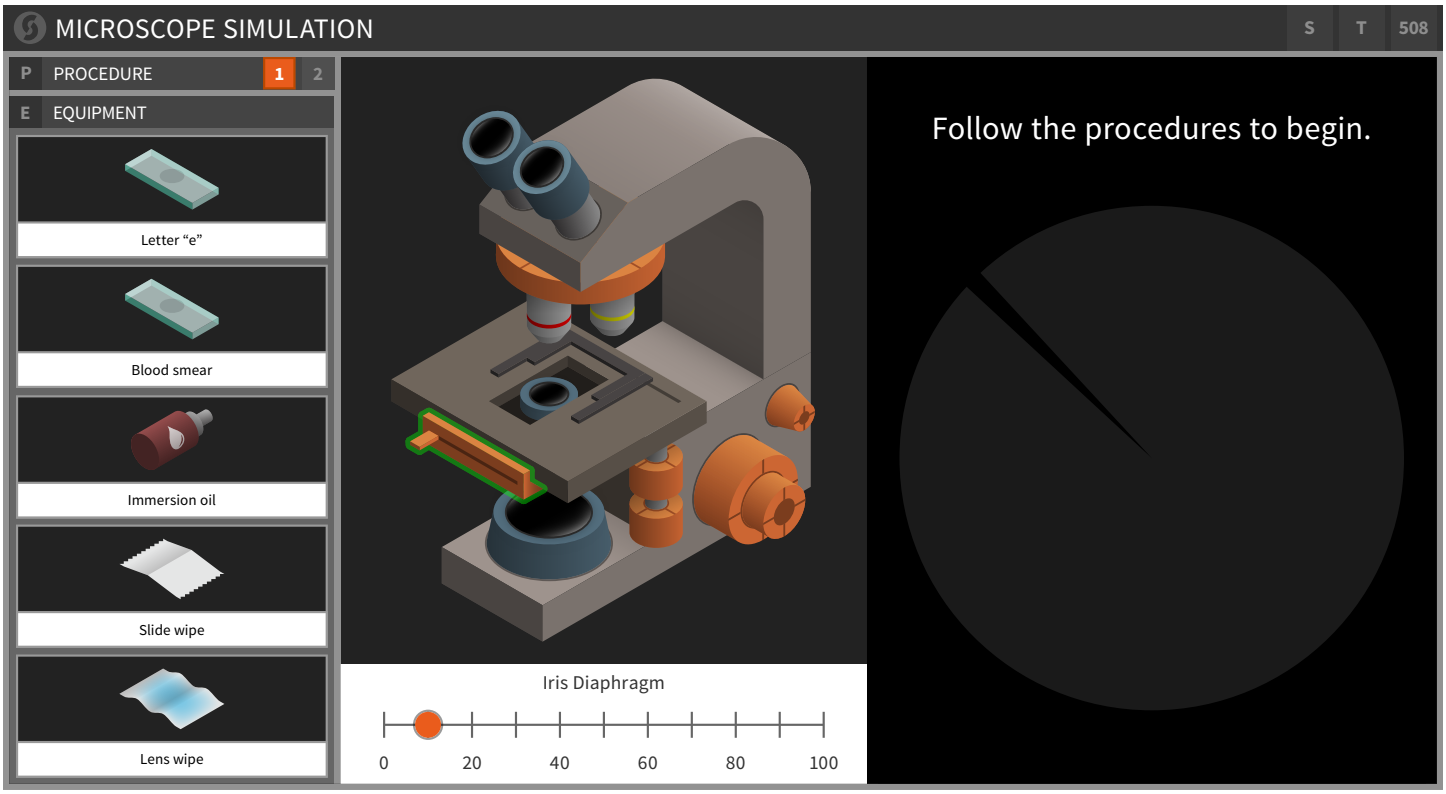



Screen 6

When an orange microscope part is clicked, the green overlay will transition to a green outline to show it is active. The panel under the microscope is the controller for the selected part of the microscope. In this screen, the “Objective Lens” control has been selected.

The orange circle controller button for each microscope part will be dragged along a horizontal line.

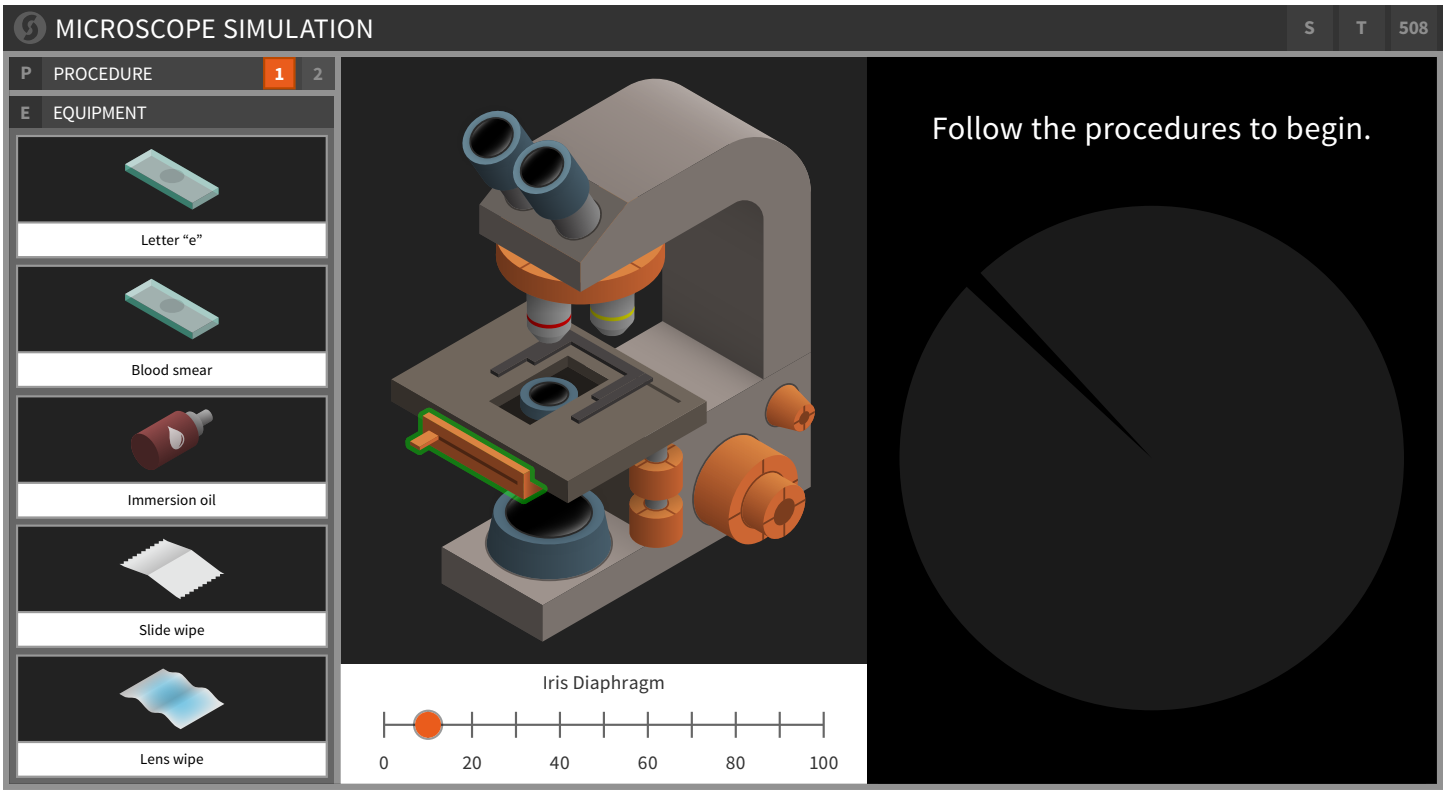
For the “Objective Lens” control, when the controller button is released, it will snap in place to the nearest vertical marker. This means that the lenses can only stop at the main resting points and halfway between. The halfway point between the 40X and 100X lenses is used for the oil immersion procedures.




Screen 7

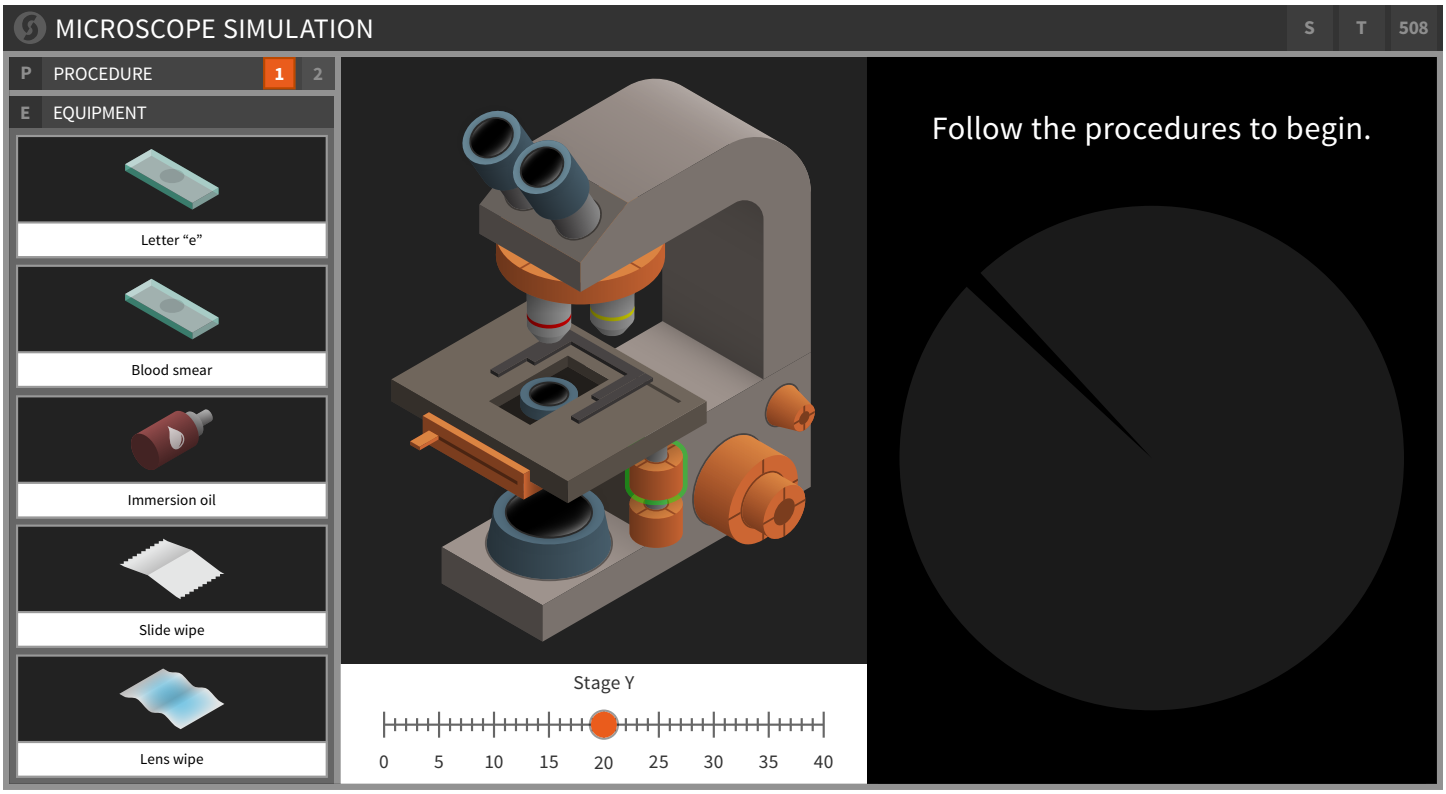
The “Iris Diaphragm” control.

The scale has been changed to 0 (closed) - 100 (open)



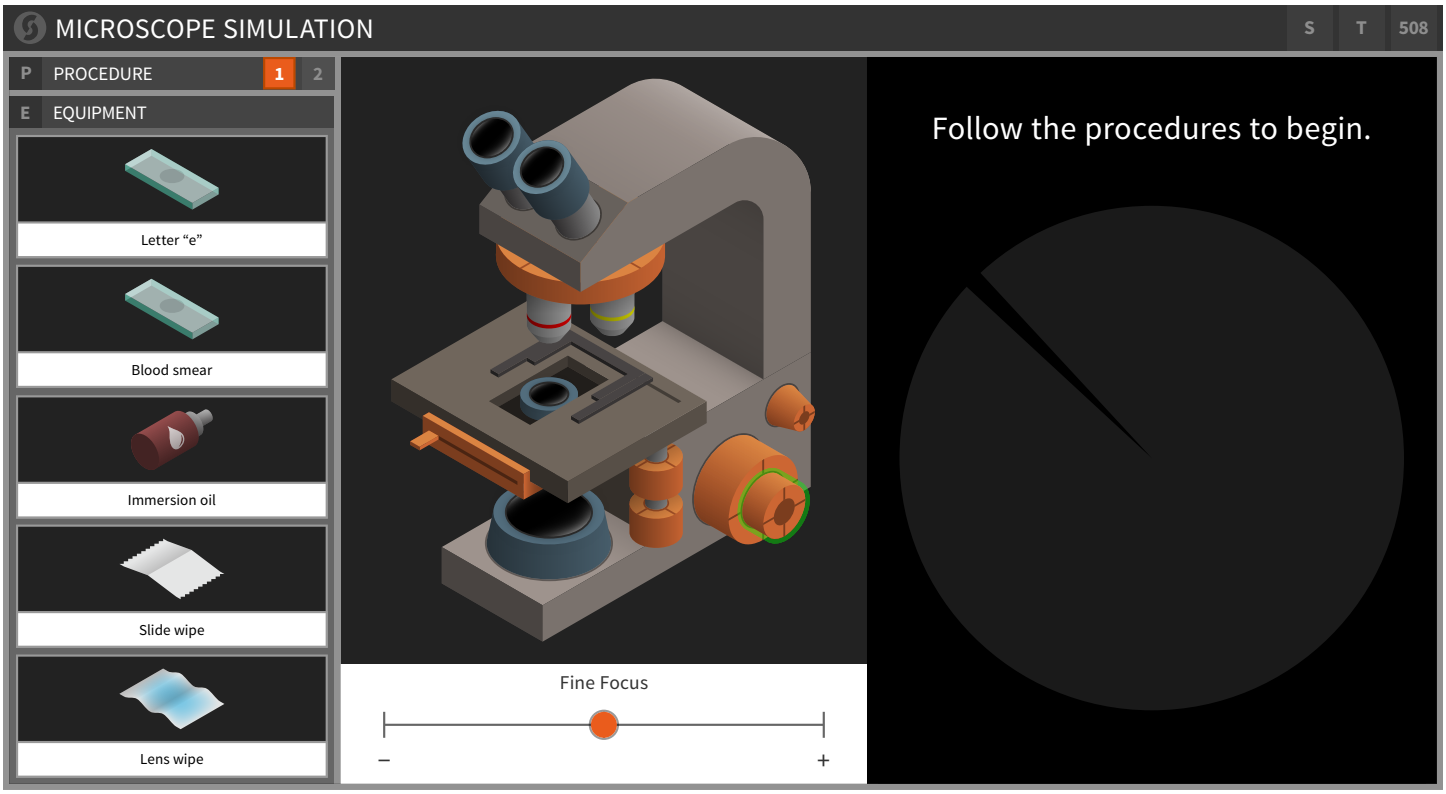

Screen 8

The “Stage X” control.




Screen 9

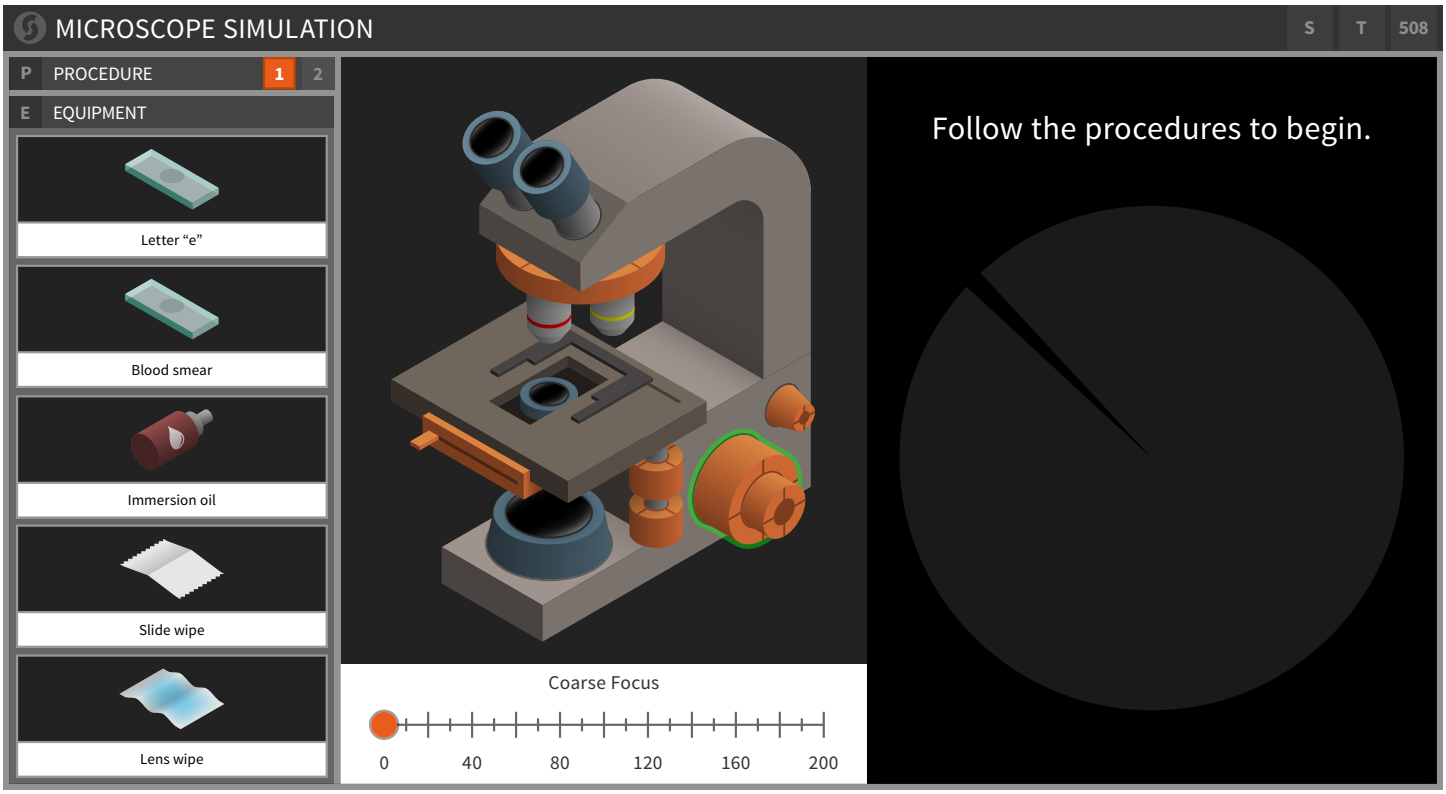
The “Stage Y” control.




Screen 10

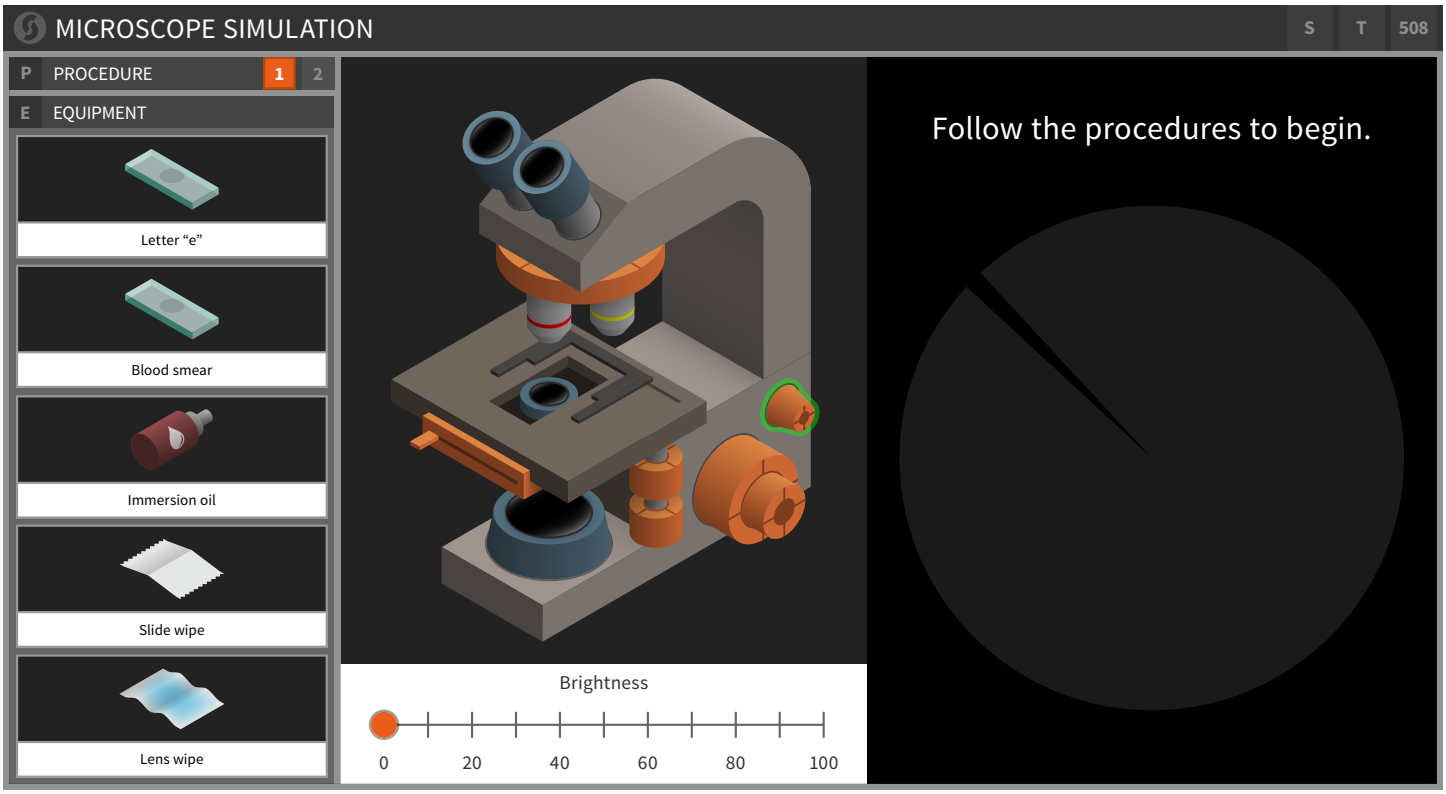
The “Fine Focus” control.

The fine focus controller defaults to the middle. Pulling the controller to the right will spin the dial slowly clockwise, and pulling the controller to the left will spin the dial slowly counterclockwise. The controller will snap back to the center when it is released.



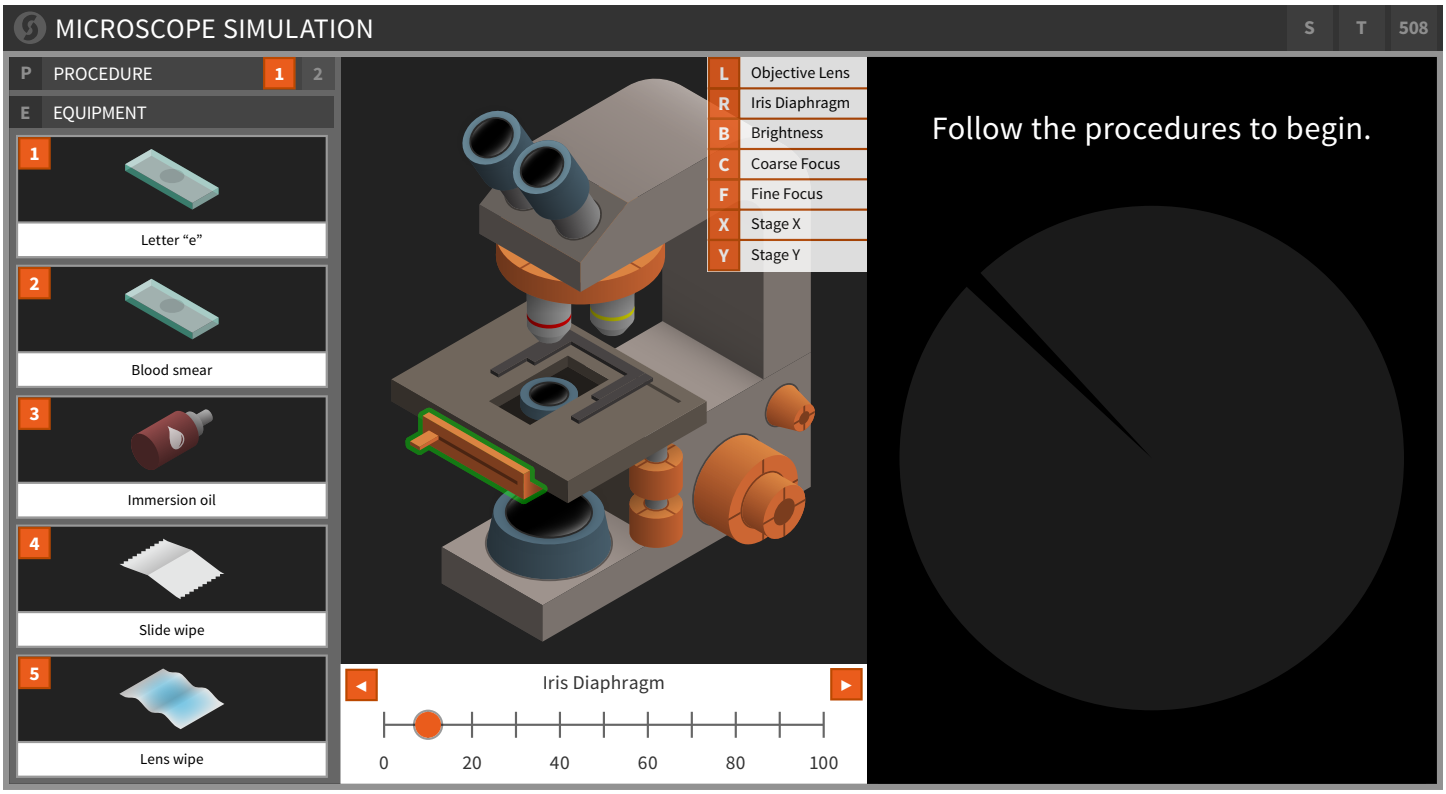

Screen 11

The “Coarse Focus” control.




Screen 12

The “Brightness” control.




Screen 13

When 508 functionality is activated, it will reveal key codes for each part of the microscope and the equipment items. When a microscope part is selected, the left and right arrows will move the orange controller.

The rest of the course functionality will be covered in the “Bacterial Morphology” section of this document.

The procedures for the "Microscope Simulation":

PROCEDURE 1

1. Select the "Brightness" control on the microscope. Increase the brightness by moving the slider button, in the panel under the microscope, to the right.

2. Start with the objective lens set to 4X.

3. Move the "Letter e" slide from the equipment panel to the slide holder on the microscope stage.

4. Adjust the "Stage X" and "Stage Y" controls to center the letter e on the tip of the black pointer in the field of view.

5. Use the "Brightness" and "Iris Diaphragm" controls to adjust the amount of light reaching the slide.

6. Adjust the "Coarse Focus" control to improve the sharpness of the letter e. Adjust the "Fine Focus" control to clarify the e with more precision.

7. Change the "Objective Lens" control to 10X. Notice the size change of the letter e in the field of view.

8. Use the focus controls to improve the sharpness of the image.

9. Adjust the "Brightness" and "Iris Diaphragm" controls to further experiment with the clarity of the letter e.

10. Change the "Objective Lens" control to 40X. Notice the size change of the letter e in the field of view.

11. Adjust the "Fine Focus" controls to improve the sharpness of the letter e. Since the microscope is parfocal and the slide is already very close to the lens, you will not use the "Coarse Focus" for this step.

12. Adjust the "Brightness" and "Iris Diaphragm" controls to further experiment with the clarity of the letter e.

13. When you are finished with the "Letter e" slide, place it back in the equipment panel. Change the objective lens back to 4X then continue to Procedure 2.

PROCEDURE 2

1. Move the "Blood Smear" slide from the equipment panel to the slide holder on the microscope stage.

2. Start with the objective lens set to 4X.

3. Adjust the "Stage X" and "Stage Y" controls to center an evenly dispersed cluster of blood cells in the field of view.

4. Use the "Brightness" and "Iris Diaphragm" controls to adjust the amount of light reaching the slide.

5. Adjust the "Coarse Focus" control to improve the sharpness of the blood cells. Adjust the "Fine Focus" control to view the cells more clearly.

6. Change the "Objective Lens" control to 10X.

7. Use the "Coarse Focus" and "Fine Focus" controls to improve the sharpness of the image.

8. Adjust the "Brightness" and "Iris Diaphragm" controls to further experiment with the clarity of the blood cells.

9. Observe and take note of the new details at this magnification.

10. Change the "Objective Lens" control to 40X.

11. Adjust the "Fine Focus" control to improve the sharpness of the blood cells. Remember that the "Coarse Focus" can be damaging to the microscope at this magnification.

12. Adjust the "Brightness" and "Iris Diaphragm" controls to further experiment with the clarity of the blood cells.

13. Observe and take note of the new details at this magnification.

14. Change the "Objective Lens" control to the halfway point between 40X and 100X.

15. Move the "Immersion Oil" bottle from the equipment panel and hover it over the slide. Click the bottle on the center of slide for each drop. Two drops is enough to immerse the objective lens.

16. Change the "Objective Lens" control to 100X. This will drag the lens into the oil, increasing the resolution of the blood cell.

17. Adjust the "Fine Focus" control to improve the sharpness of the blood cells. Remember that the "Coarse Focus" can be damaging to the microscope at this magnification.

18. Adjust the "Brightness" and "Iris Diaphragm" controls to further experiment with the clarity of the blood cells.

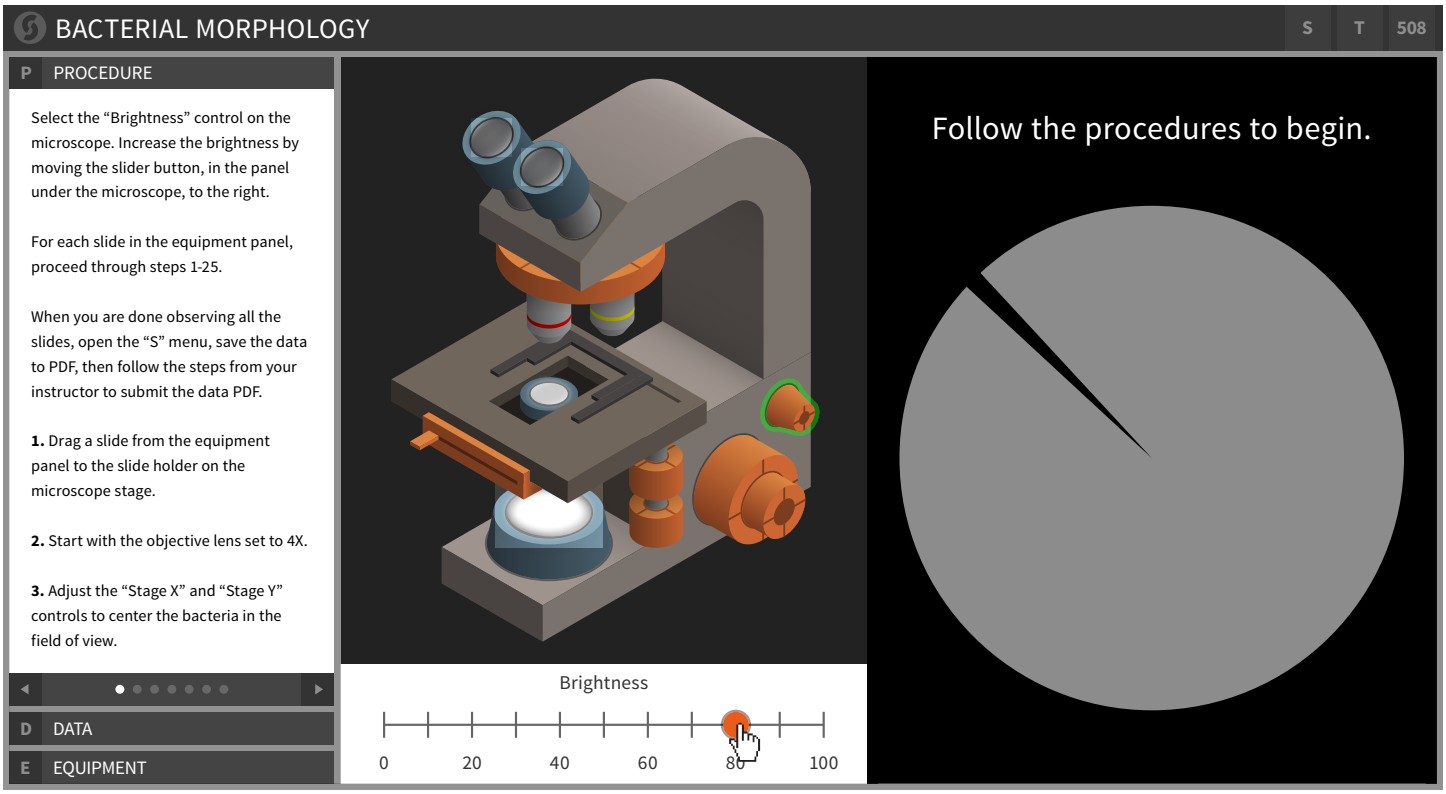
19. Observe and take note of the new details at this magnification.

20. Change the "Objective Lens" control back to the halfway point between 40X and 100X.

21. Move the "Lens Wipe" from the equipment panel and click it over the 100X objective lens to clean off the oil.

22. Move the "Slide Wipe" from the equipment panel and click it over the slide to clean off the oil.

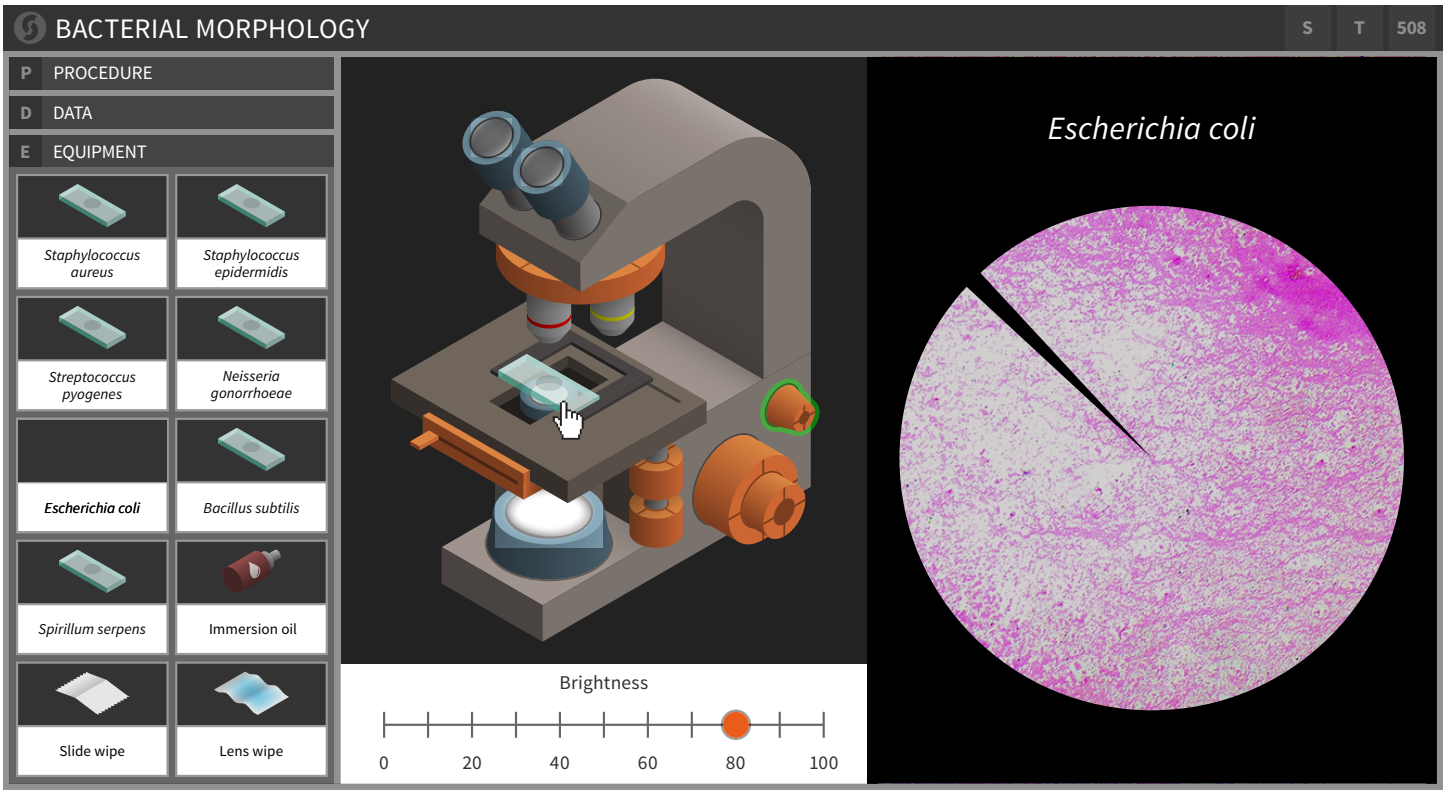
23. When you are finished with the "Blood Smear" slide, place it back in the equipment panel. Change the "Objective Lens" control back to 4X and turn the "Brightness" control down to 0.




Screen 14

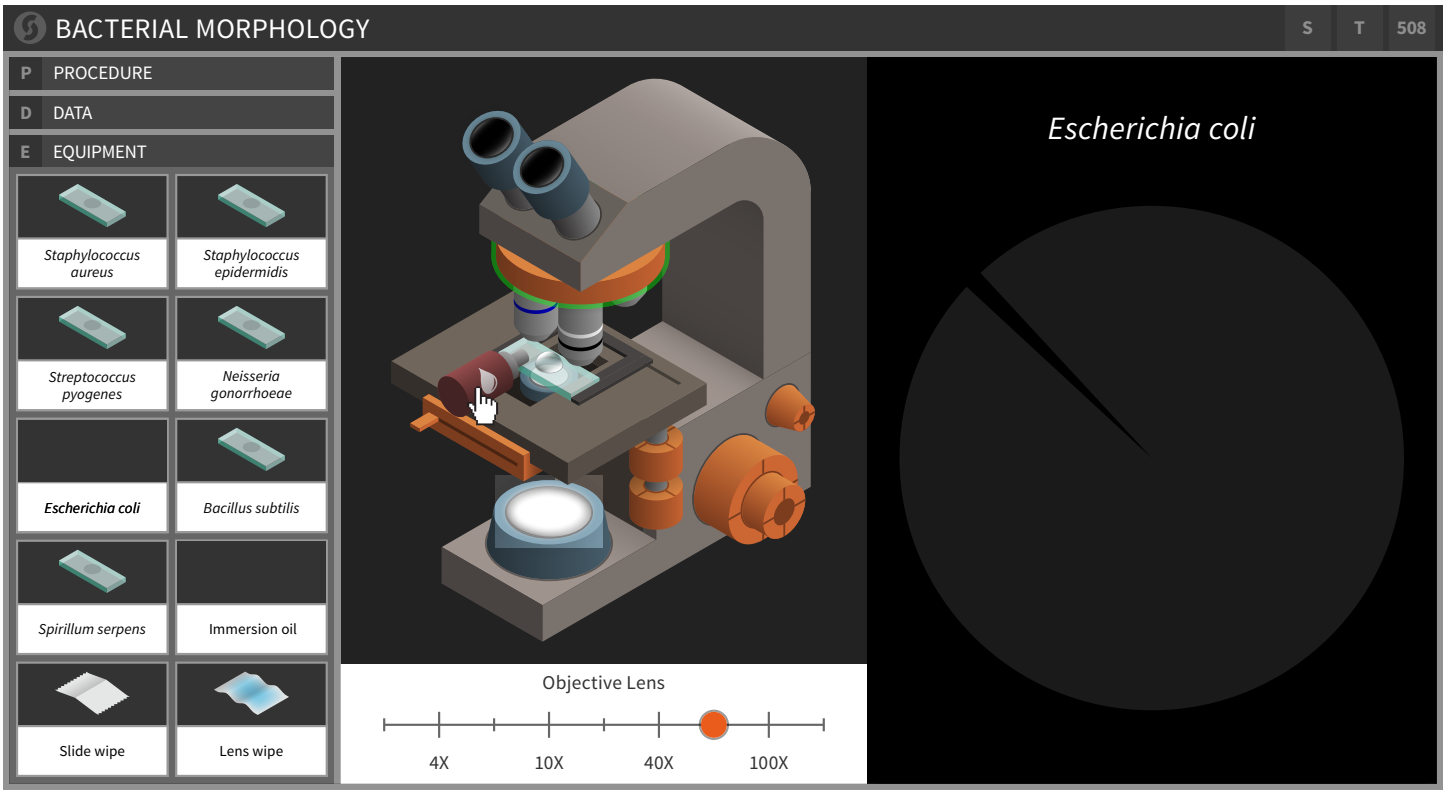
The "Bacterial Morphology" lab will start with the same opening screen and tutorial menu (not shown here).

This is an example of the user increasing the bulb brightness to 80%.




Screen 15

The user places a slide in the slide holder on the stage. The title over the viewfinder updates to reflect the slide content.

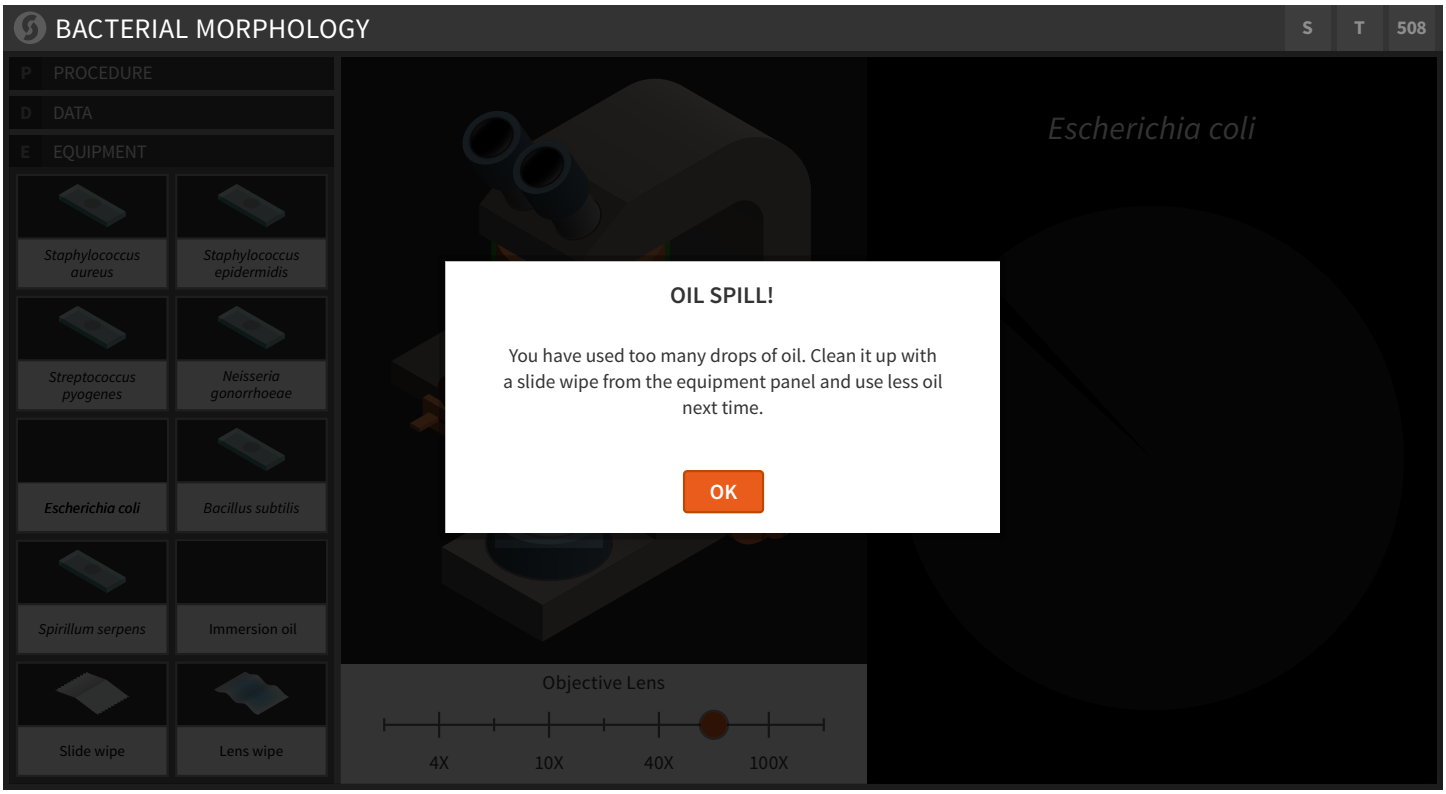



Screen 16

The oil immersion process.

The stage has been raised using the coarse focus during previous procedures. The lenses have been set halfway between the 40X and 100X lenses.

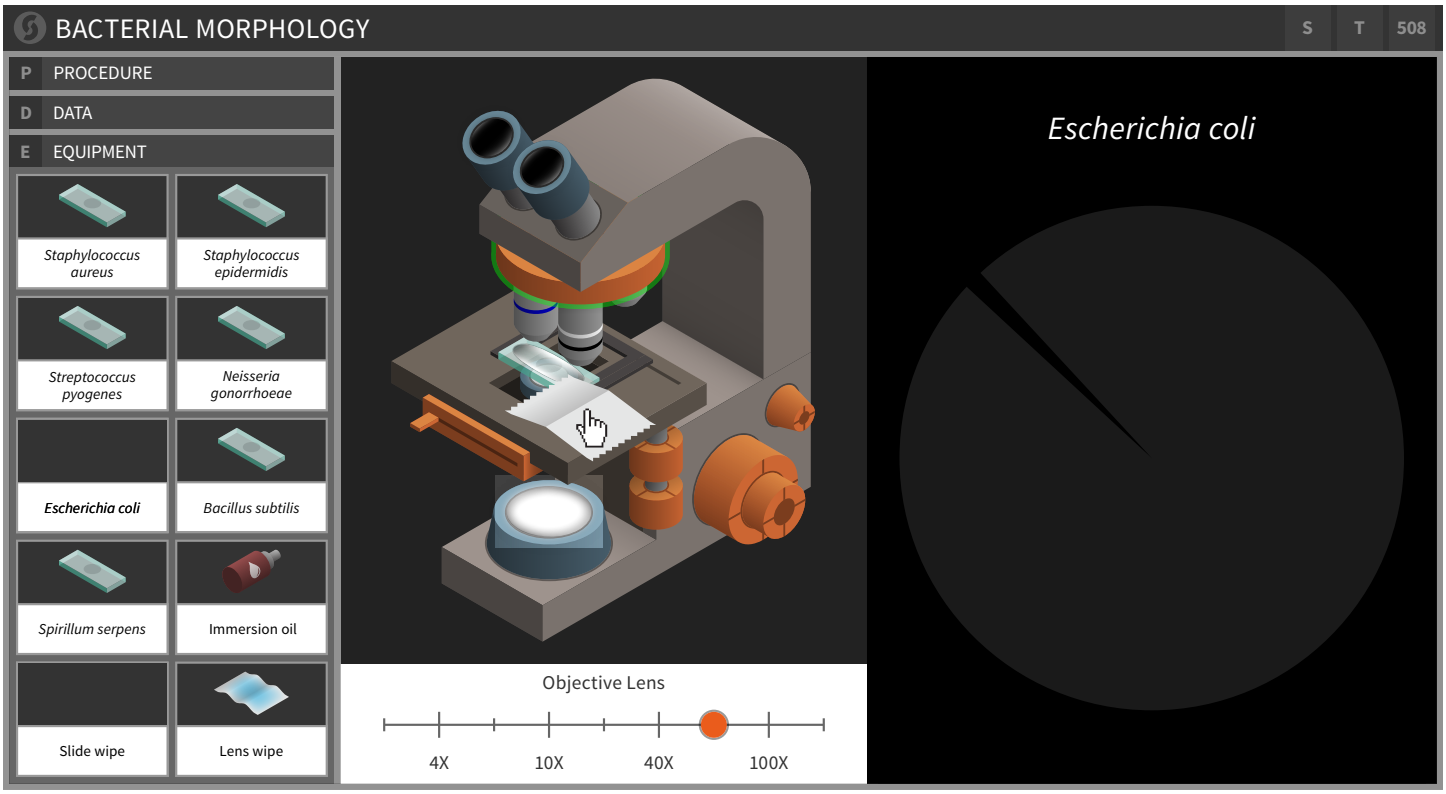
Two drops of oil have just been applied to the slide. If any part of the bottle is touching a part of the slide when the user clicks the bottle, it will be recognized as valid and an oil drop will form in the center of the slide.




Screen 17

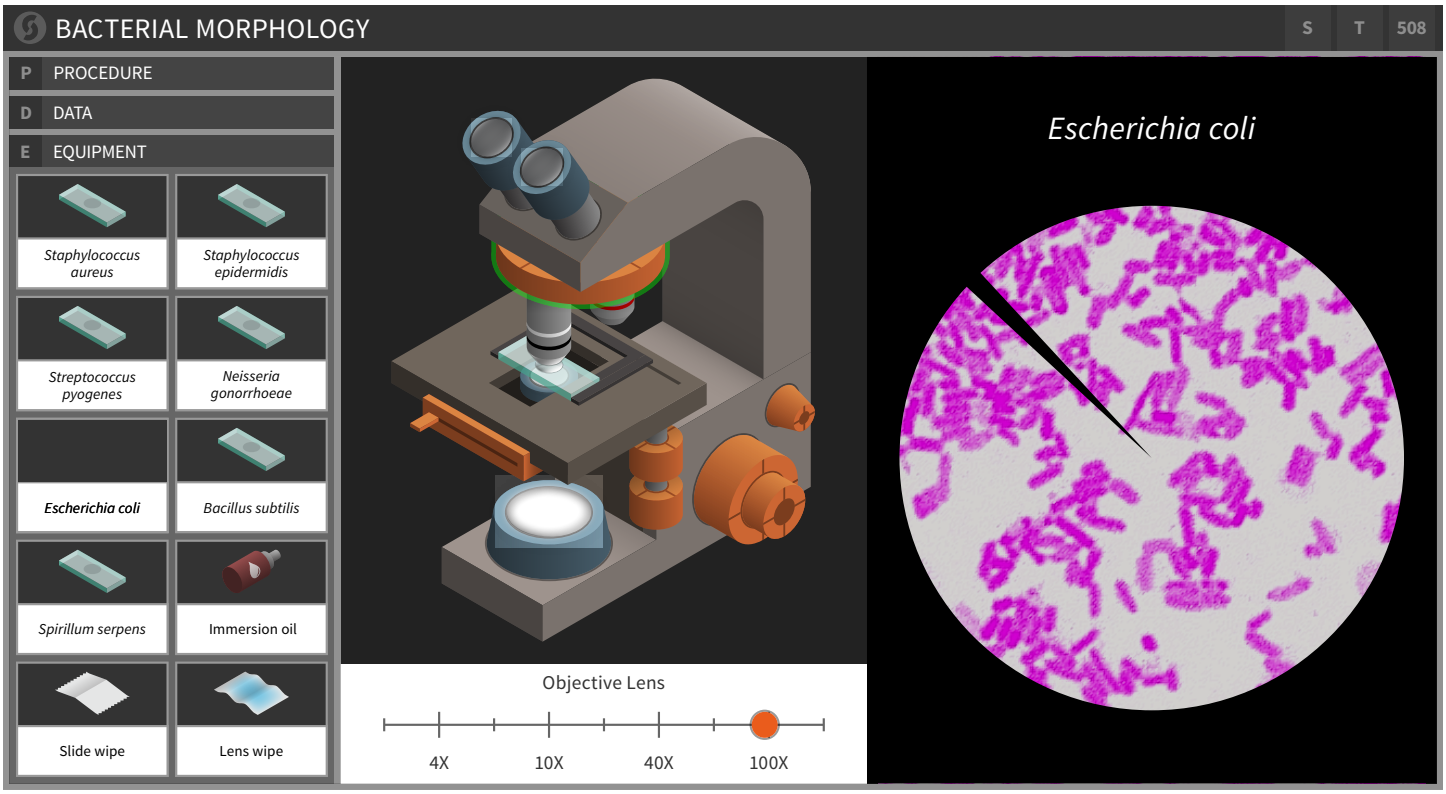
If the user has put more than two drops on the slide, a message tells the user, “OIL SPILL! You have used too many drops of oil. Clean it up with a slide wipe from the equipment panel and use less oil next time.” [OK]

Clicking OK will get rid of the message and the user won’t be able to do anything else until the slide is cleaned up.



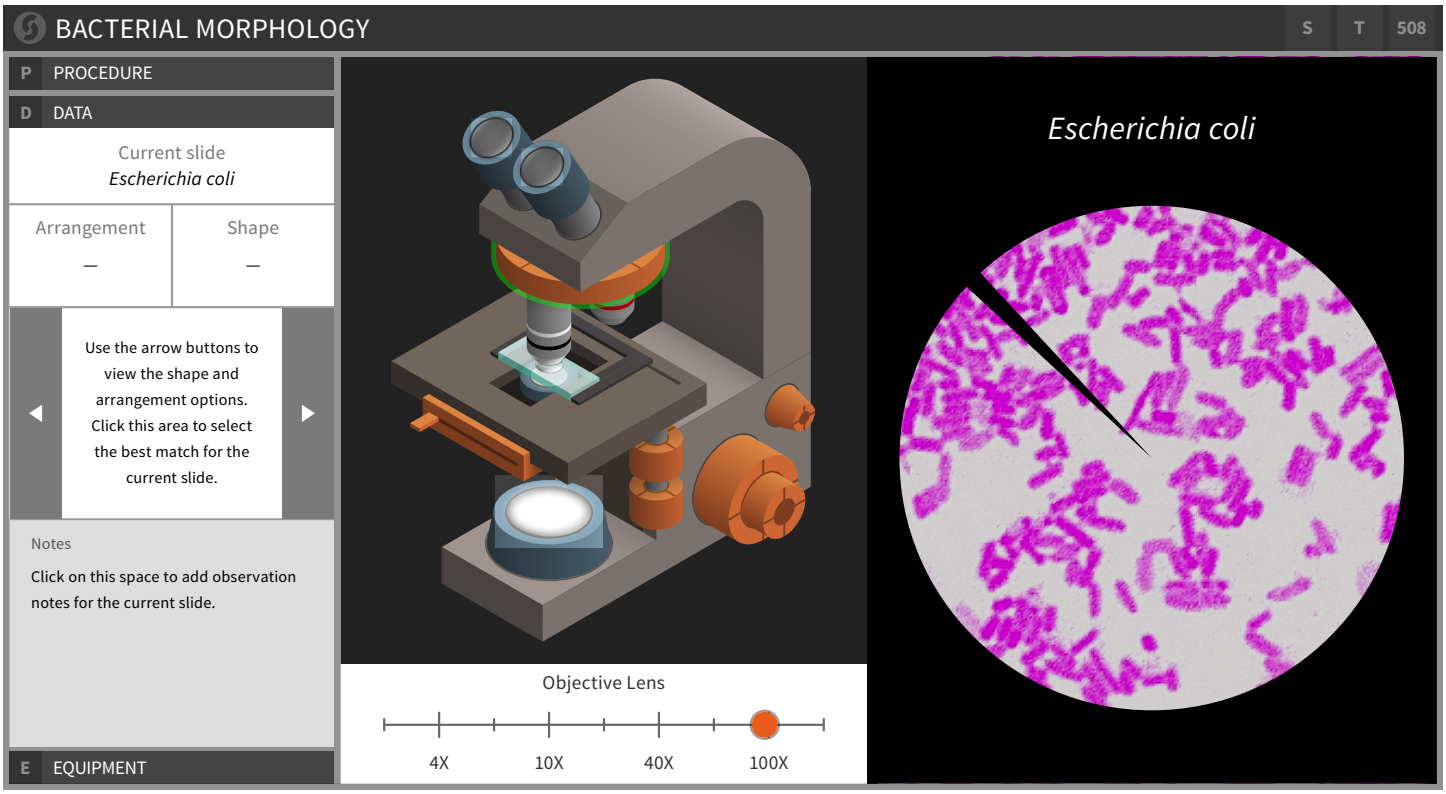

Screen 18

As long as the slide wipe is touching a part of the slide when the user clicks, the oil will go away.




Screen 19

The oil has been cleaned up and only 2 drops have been reapplied. The 100X lens is now submerged in oil so the user can identify the bacteria for the data entry section of this lab.



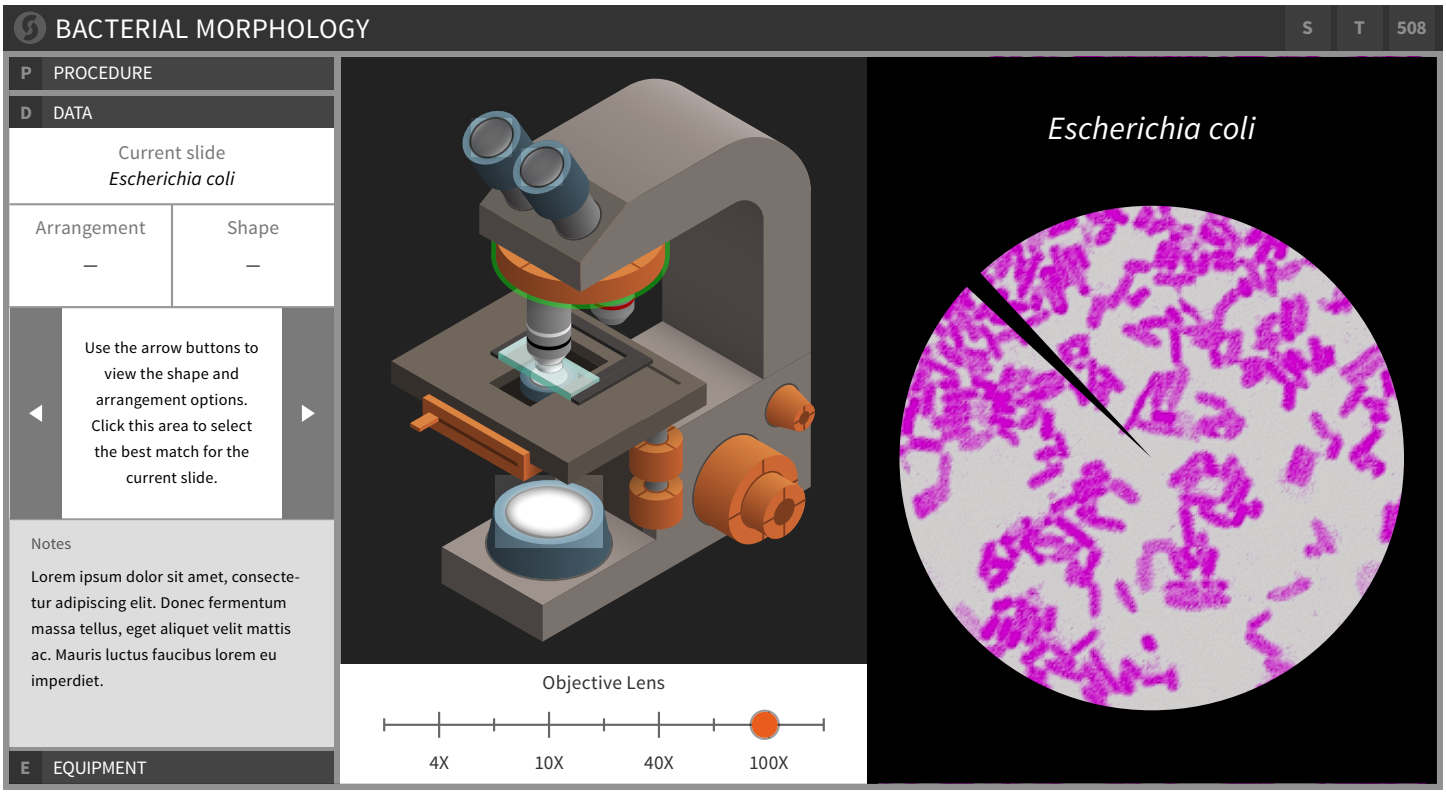

Screen 20

The user has opened the data panel.

If the user has not chosen a shape/arrangement configuration yet for the current slide, the space next in between the arrow buttons will inform, "Use the arrow buttons to select the best match for the arrangement and shape of the bacteria in the current slide."

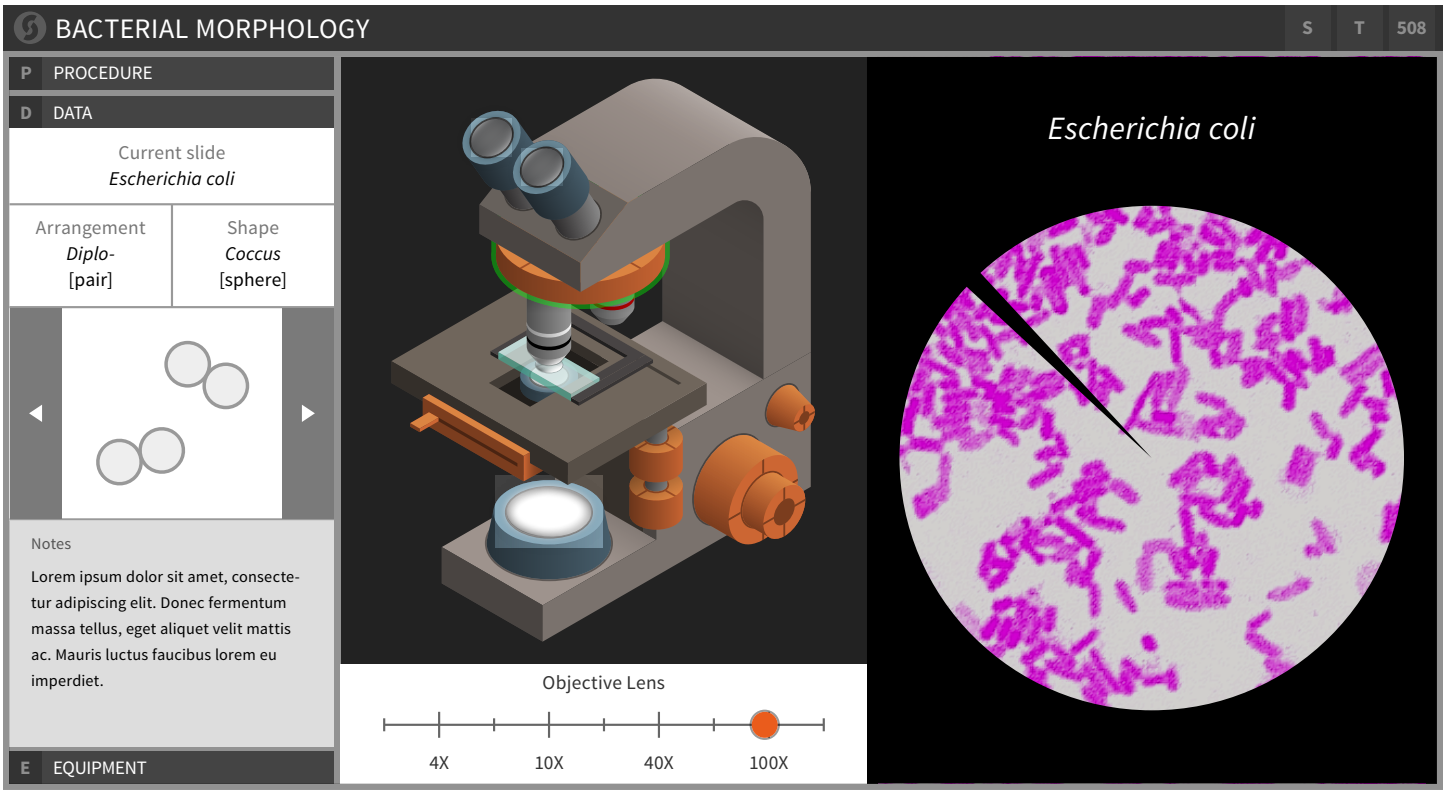
The notes area has been updated to include:

"Click on this space to add observation notes for the current slide."



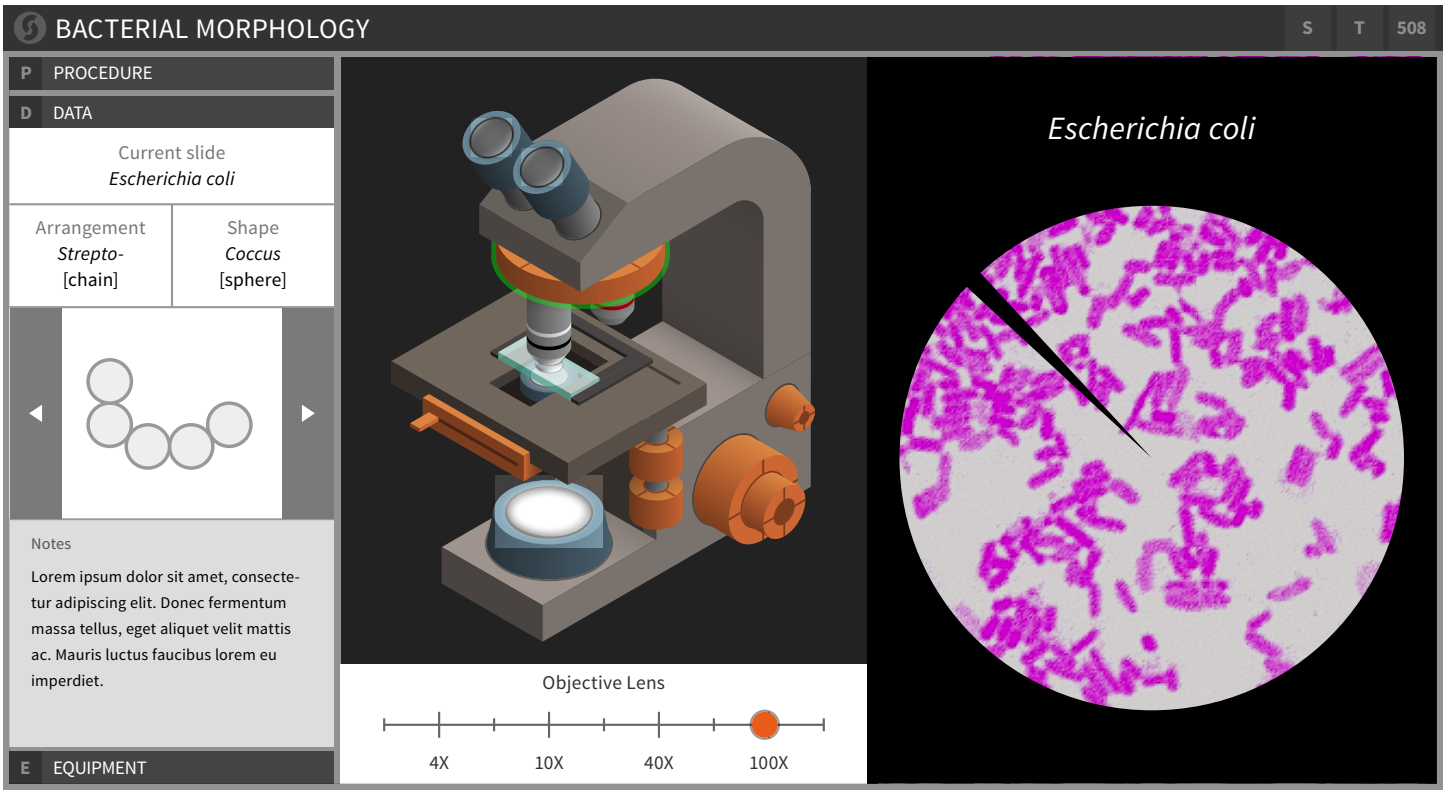

Screen 21

An example of notes typed into the notes section.



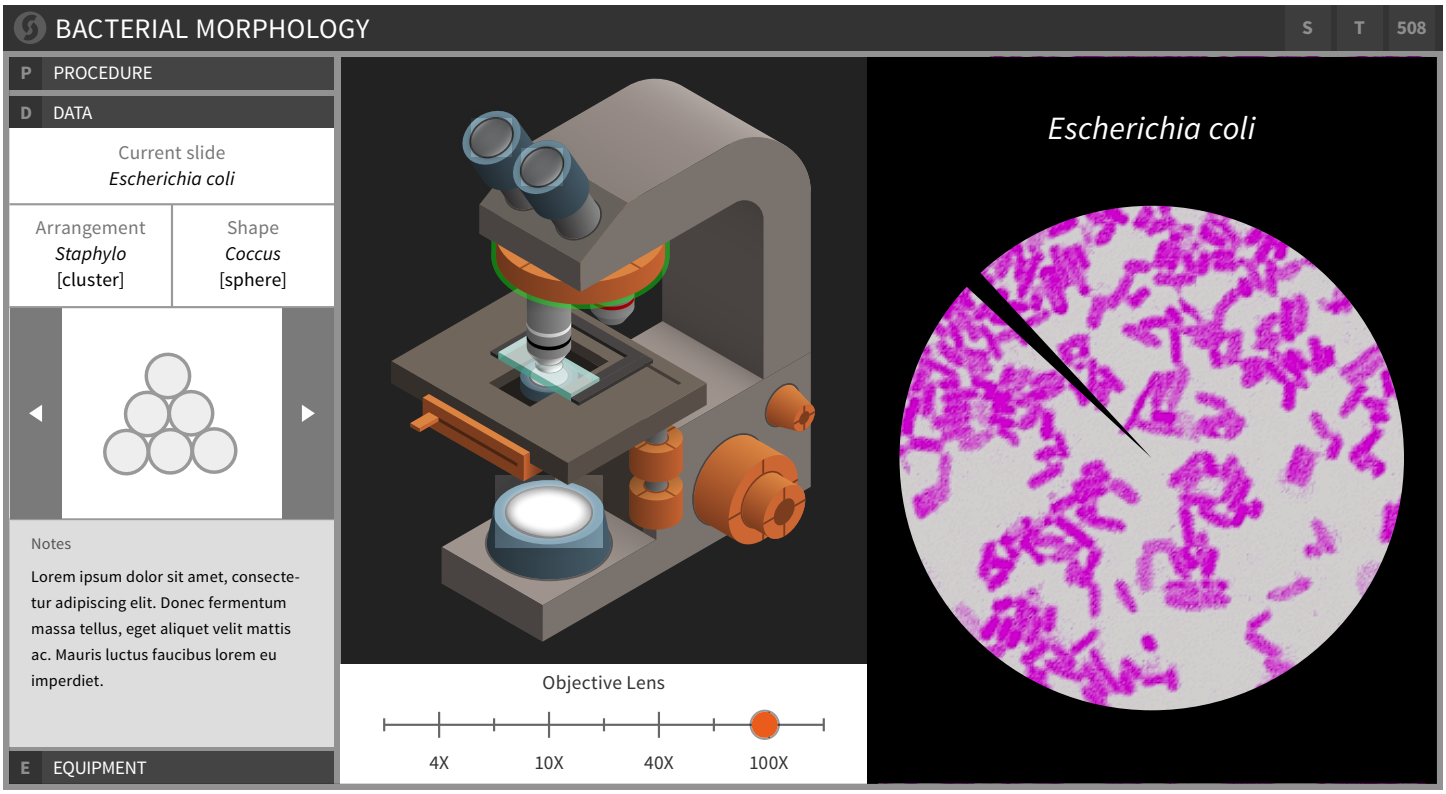

Screen 22

The diplo-coccus shape/arrangement option is selected. The arrangement and shape columns also show the simple terms.



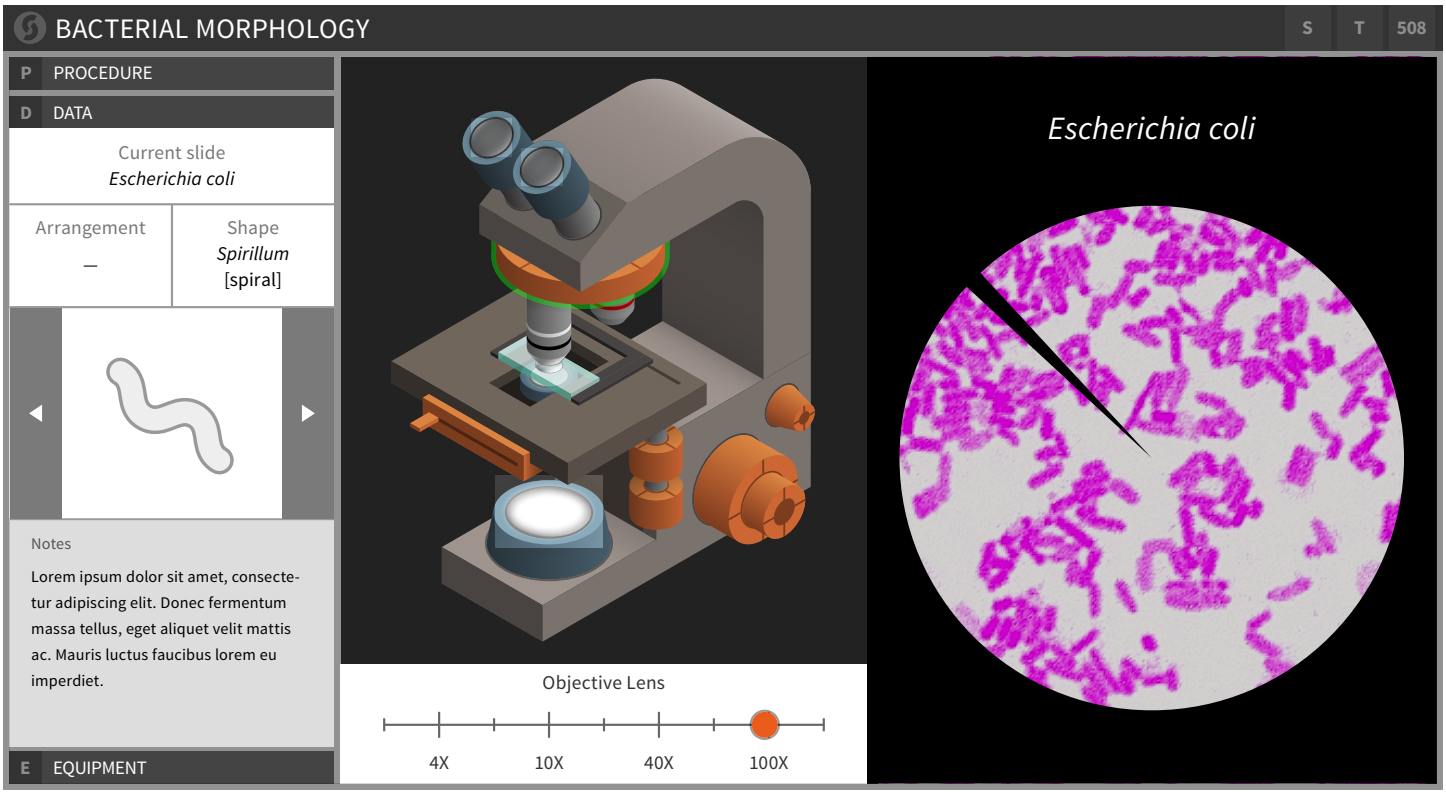

Screen 23

Strepto-coccus



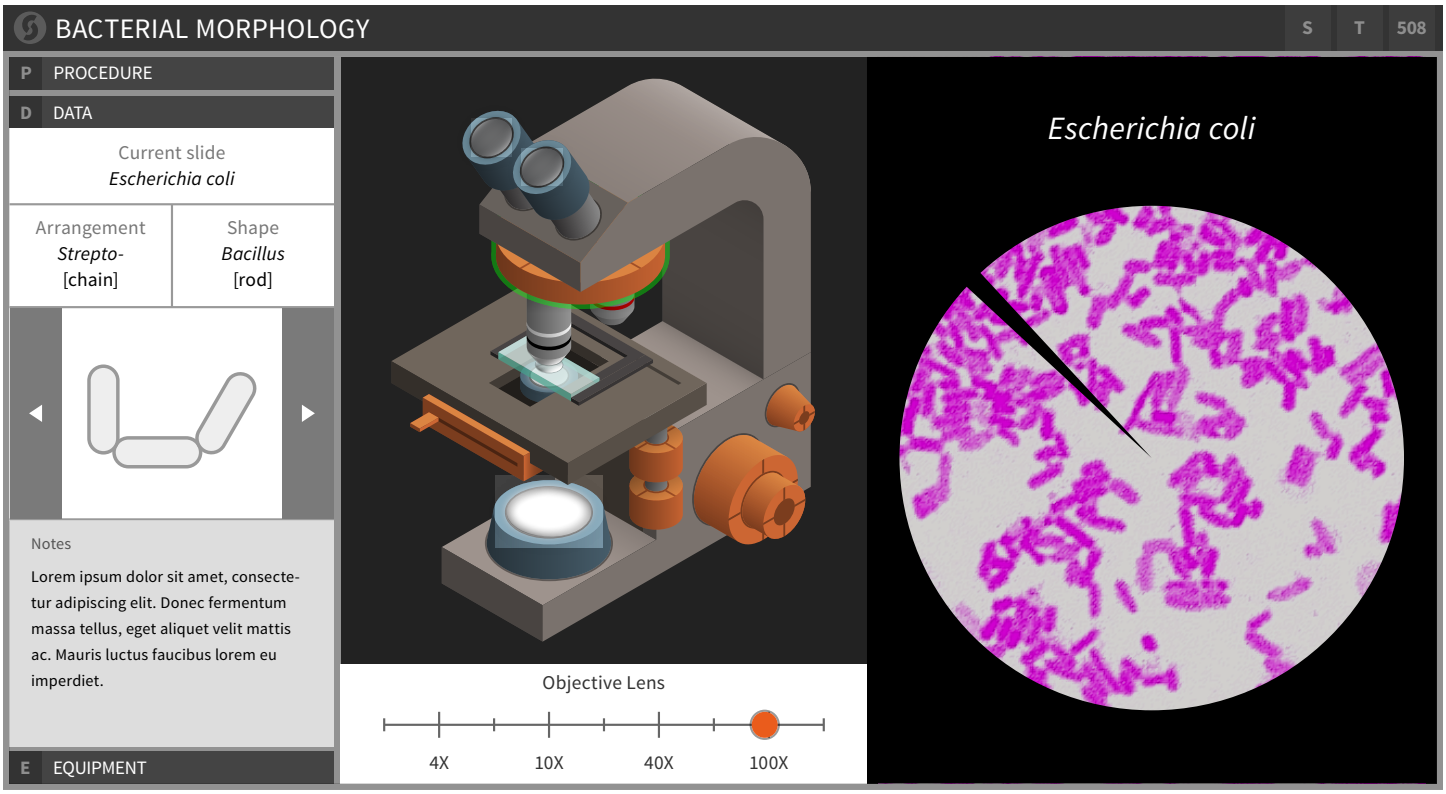

Screen 24

Staphylo-coccus



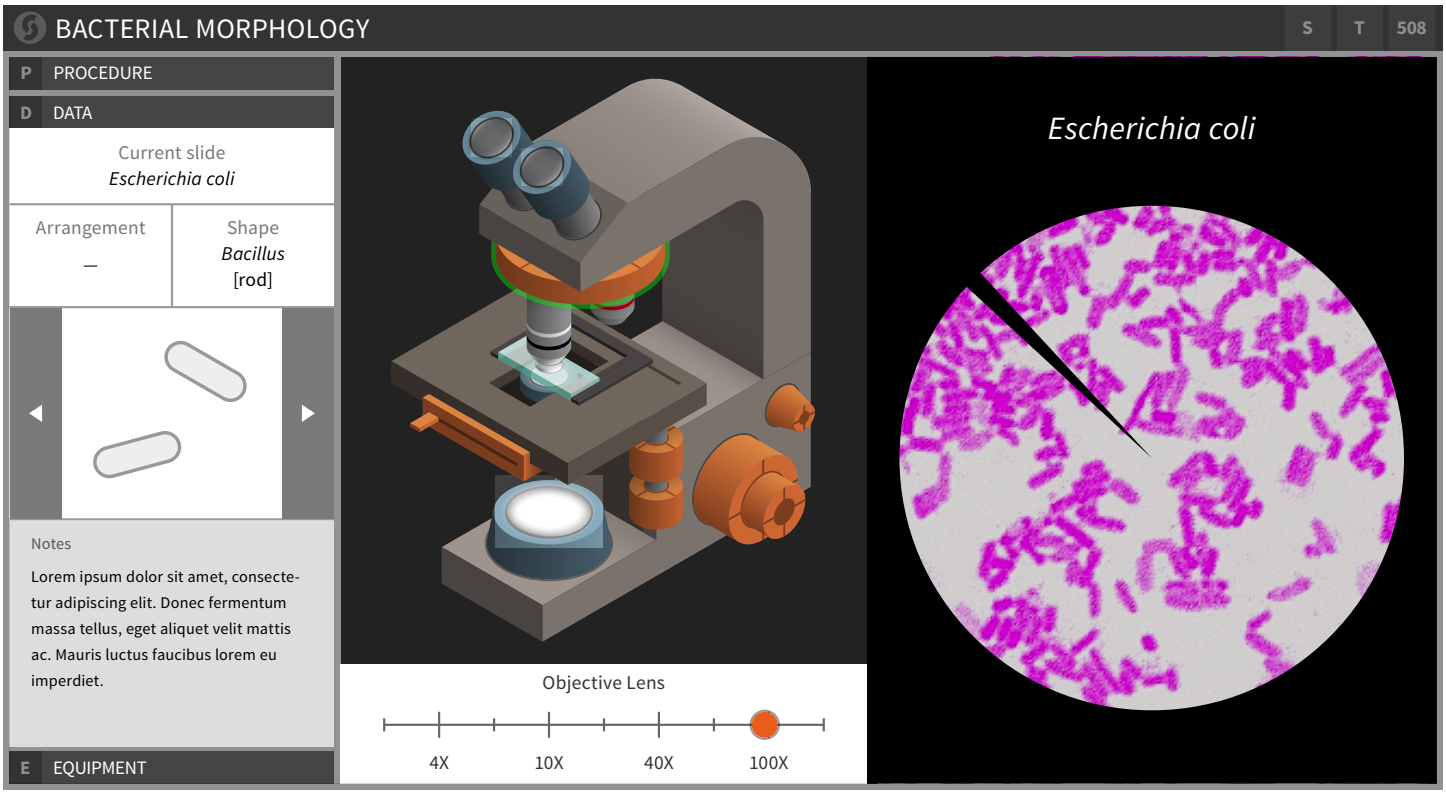

Screen 25

Spirillum



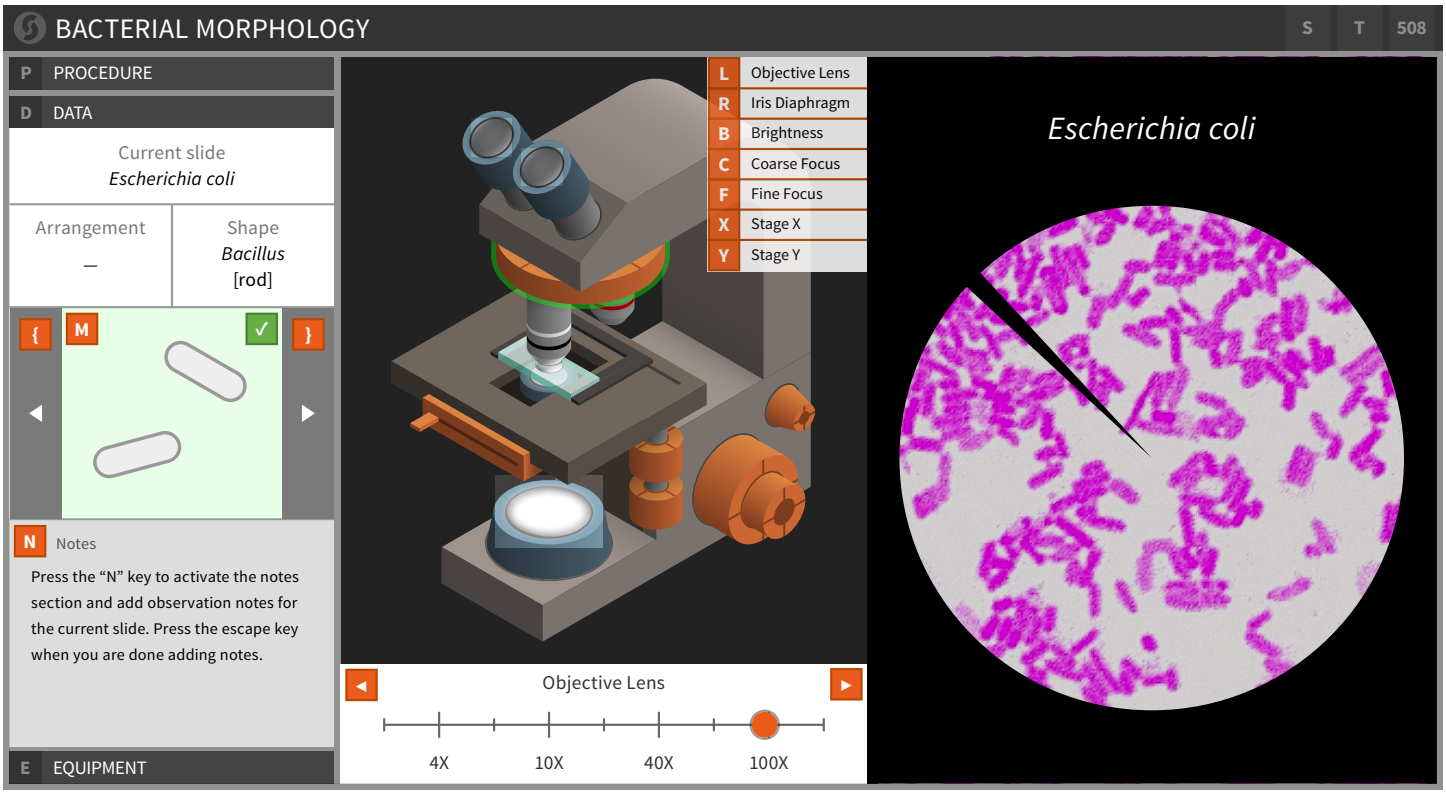

Screen 26

Strepto-bacillus




Screen 27

Bacillus



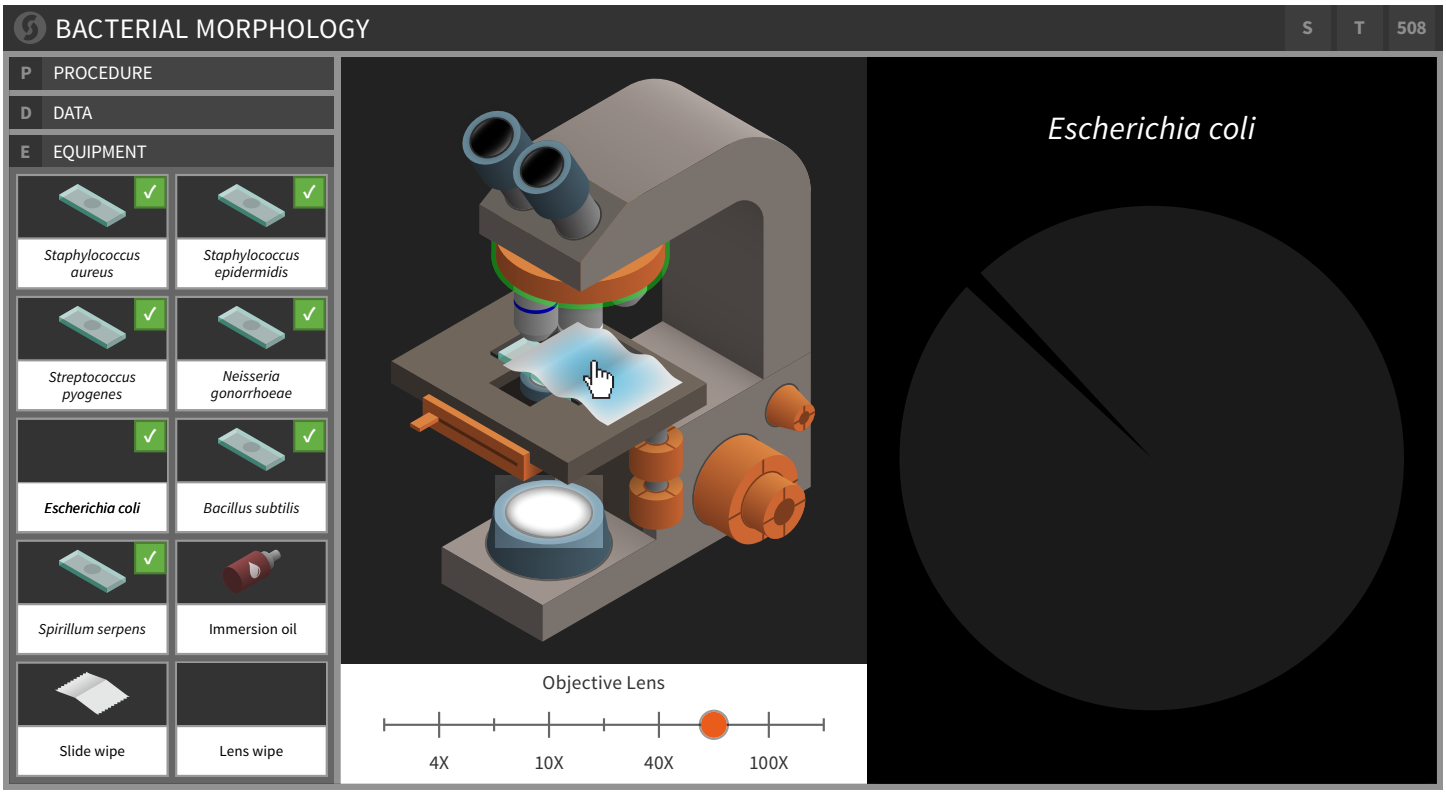

Screen 28

The 508 version of the data selection.

This has been updated to include "N" for 508 access to the Notes section. The message in the notes section for 508 is:

"Press the "N" key to activate the notes section and add observation notes for the current slide. Press the escape key when you are done adding notes."

This is also showing an example of a selected shape/arrangement configuration. When the user clicks on the arrangement they want, a green checkmark will show up and give further indication by changing the background color green.



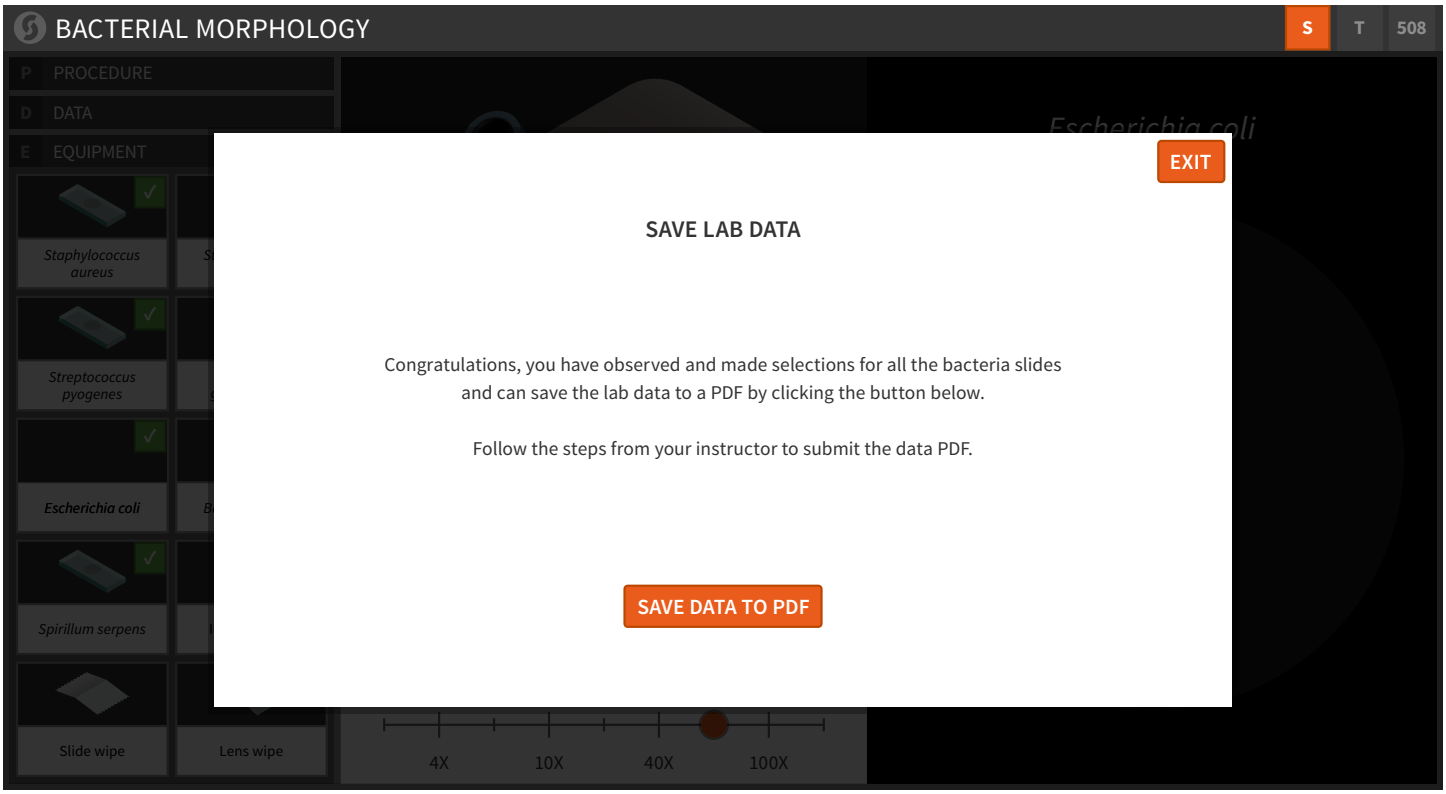

Screen 29

Once the user has made their selection, the oil must be cleaned off the slide and lens before putting the slide back.

This example shows a lens wipe cleaning the 100X lens after it has been submerged in the drops of oil. As long as a part of the lens wipe touches a part of the oily lens when the user clicks, the oil will go away.

A green checkbox will appear in a slide holder in the equipment panel when a data selection is made.

When all of the slides have checkboxes, the user can download their data table upload it to the class dropbox.



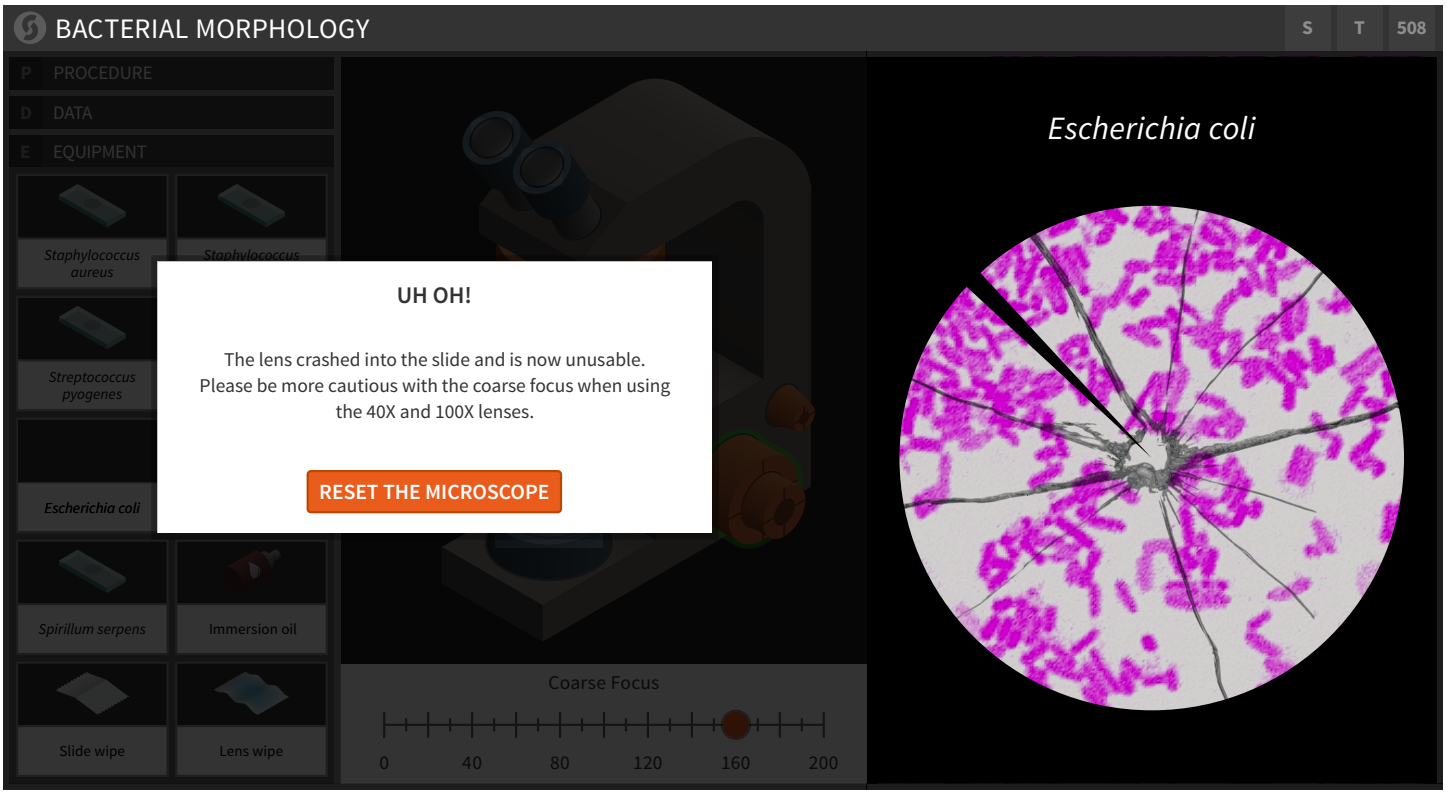

Screen 30

In the procedures, the user is instructed to select the "S" menu when all the slides have been completed.

When the menu is open, there will be one of two messages.

1. If the user has chosen a shape/arrangement for each slide: "Congratulations, you have observed and made selections for all the bacteria slides and can save the lab data to a PDF by clicking the button below. Follow the steps from your instructor to submit the data PDF." [SAVE DATA TO PDF]

2. If the user hasn't completed all the slides: "You must follow the procedures for all 7 slides. So far, you have only completed [number] slides." [OK]




Screen 31

If the user adjusts the coarse focus when the lens is too close to the slide, a message informs them "UH OH! The lens crashed into the slide and is now unusable. Please be more cautious with the coarse focus when using the 40X and 100X lenses." [RESET THE MICROSCOPE]

The RESET button will put the slide back in the equipment panel and return the microscope to the default settings.

The procedures for "Bacterial Morphology":

Select the "Brightness" control on the microscope. Increase the brightness by moving the slider button, in the panel under the microscope, to the right.

For each slide in the equipment panel, proceed through steps 1-25.

When you are done observing all the slides, open the "S" menu, save the data to PDF, then follow the steps from your instructor to submit the data PDF.

1. Drag a slide from the equipment panel to the slide holder on the microscope stage.

2. Start with the objective lens set to 4X.

3. Adjust the "Stage X" and "Stage Y" controls to center the bacteria in the field of view.

4. Use the "Brightness" and "Iris Diaphragm" controls to adjust the amount of light reaching the slide.

5. Adjust the "Coarse Focus" control to improve the sharpness of the bacteria. Adjust the "Fine Focus" control to clarify the bacteria with more precision.

6. Examine the details at this magnification and record any observations in the "Notes" section of the data panel. to open the data panel, click on the accordion menu item labeled "DATA" below the procedure instructions.

7. Change the "Objective Lens" control to 10X.

8. Use the "Coarse Focus" and "Fine Focus" controls to improve the sharpness of the image.

9. Adjust the "Brightness" and "Iris Diaphragm" controls to further experiment with the clarity of the bacteria.

10. Examine the details at this magnification and record any observations in the "Notes" section of the data panel.

11. Change the "Objective Lens" control to 40X.

12. Adjust the "Fine Focus" control to improve the sharpness of the bacteria. Remember that the "Coarse Focus" can be damaging to the microscope at this magnification.

13. Adjust the "Brightness" and "Iris Diaphragm" controls to further experiment with the clarity of the bacteria.

14. Examine the details at this magnification and record any observations in the "Notes" section of the data panel.

15. Change the "Objective Lens" control to the halfway point between 40X and 100X.

16. Move the "Immersion Oil" bottle from the equipment panel and hover it over the slide. Click the bottle on the center of slide for each drop. Two drops is enough to immerse the objective lens.

17. Change the "Objective Lens" control to 100X. This will drag the lens into the oil, increasing the resolution of the bacteria.

18. Adjust the "Fine Focus" control to improve the sharpness of the bacteria. Remember that the "Coarse Focus" can be damaging to the microscope at this magnification.

19. Adjust the "Brightness" and "Iris Diaphragm" controls to further experiment with the clarity of the bacteria.

20. Examine the details at this magnification and record any observations in the "Notes" section of the data panel.

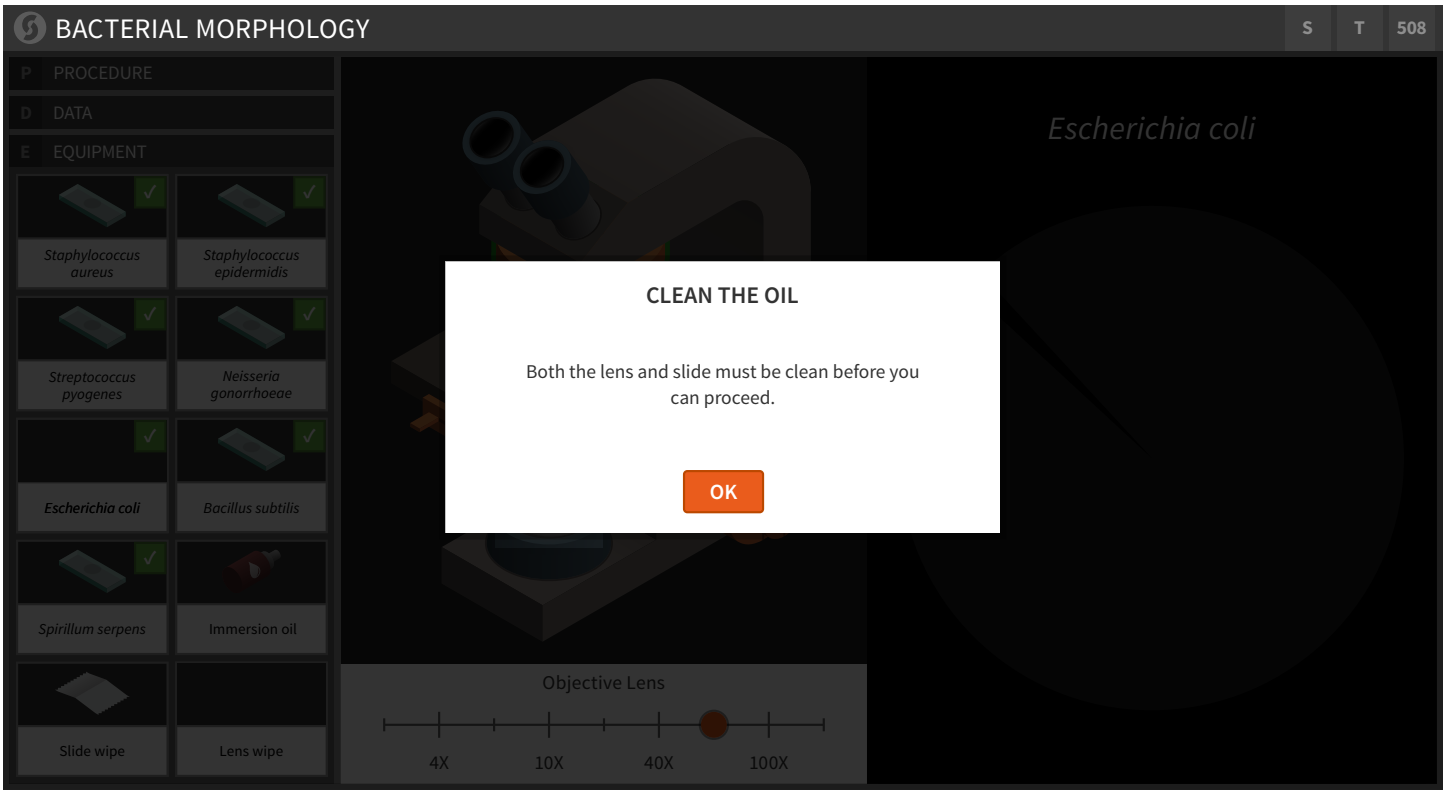
21. Use the data panel to choose which shape and arrangement best matches your observations from this bacteria slide. When you have made your selection, a green check mark will appear on this slide placeholder in the equipment panel.

22. Change the "Objective Lens" control back to the halfway point between 40X and 100X.

23. Move the "Lens Wipe" from the equipment panel and click it over the 100X objective lens to clean off the oil.

24. Move the "Slide Wipe" from the equipment panel and click it over the slide to clean off the oil.

25. When you are finished with this slide, place it back in the equipment panel. Change the "Objective Lens" control back to 4X then proceed to the next slide. Whenever you want to review or change your shape and arrangement selection for this slide, place it back on the microscope stage and open the data panel.




Screen 32

If the slide and/or lens still needs to be cleaned and the user tries to proceed without cleaning, they will get the cleaning error message:

"CLEAN THE OIL
Both the lens and slide must be clean before you can proceed."

NOTE: This applies for both labs.