

LT: I can use a microscope to observe and record characteristics of cells so that I can explain similarities and differences among cell types.

Standards: Appendix A

Microscopic Inquiry Set

During this exercise, you will observe slides showing examples of bacterial, protist, plant, and animal cells. You will create diagrams and write detailed descriptions of what you see. Then, you will conduct a simulated forensic investigation wherein you must combine your microscopy, observation, and scientific inquiry skills to solve a problem.

Activity 1: Known Slide Observation

All living things can be classified as either prokaryotic or eukaryotic. Eukaryotic organisms' cells contain membrane-bound structures such as a nucleus, whereas prokaryotic cells do not have these structures. The most common type of prokaryotic organisms are bacteria. Bacteria are single-celled organisms that do not contain a nucleus. All other living things contain eukaryotic cells- plants, animals, fungi, and a large group called protists. Protists are anything that is not a plant, animal, or fungi. Examples include amoebae and euglenas.

Materials

compound microscope

Known Slide Set including the following slides:

Slide 1: Typical Bacillus Bacteria

Slide 2: Nostoc Cyanobacteria

Slide 3: Amoeba

Slide 4: Euglena

Slide 5: Privet leaf

Slide 6: Corn stem

Slide 7: Human Epithelium Cheek cell

Slide 8: Cardiac muscle/Intercalated Disks

Procedure

1. View your first slide under the microscope. Examine the image under low and high magnifications.
2. Under the appropriate slide number on your Data Sheet, draw what you see (using pencil only) in the field of view. Label the total magnification and any structures that you can identify, for example, a nucleus, a cell wall, and/or a cell membrane.
3. For each slide, repeat the observation and documentation steps. Make sure you draw the diagrams and answer the questions that correspond to the microscope slide you are working with.
4. Make sure that all questions have been answered, and all diagrams are complete and labeled. When you have finished, inform your instructor.

LT: I can use a microscope to observe and record characteristics of cells so that I can determine the identity of unknown cell specimens.

Standards: Appendix A

Activity 2: The Case of Reckless “Ronnie Fenderbender”

Ronnie Fenderbender loves cars. He has a collection of vintage sports cars that he loves to drive very fast. This is how he came by the nickname “Reckless” Ronnie. He has already been in several minor accidents. Recently, Ronnie brought his 1966 Ford Thunderbird to the auto body repair shop with a massive dent in the front bumper. He told Tony, the repair technician, that he had hit a deer that had run into the road in front of him. Therefore, Ronnie insisted, his insurance would cover the cost of the repairs because it wasn't his fault. Tony called Ronnie's insurance company and they sent their claims assessor to the repair shop. Clint, the claims assessor, thinks that Ronnie is lying. He believes that there is no way a deer caused a dent that big. He took some samples from the bumper of Ronnie's Thunderbird to see if he could determine what Ronnie hit. Clint placed the samples on microscope slides and labeled them “Unknown.” You, the examiner, must now identify the samples to determine if Ronnie did in fact hit a deer.

Materials

compound microscope

2 “Unknown” sample slides

Procedure

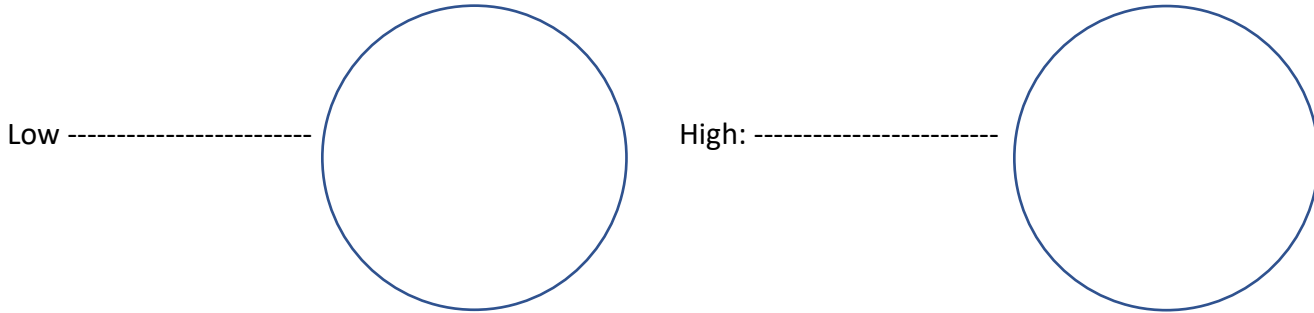
1. Review the entire activity sheet. Think about what you need to look for when viewing the two “Unknown” sample slides. Determine what information you will need in order to make recommendations to the insurance company about the settlement of “Reckless” Ronnie Fenderbender's claim.
2. Complete the entire activity sheet. Answer all the questions as completely as possible in the spaces provided. Ultimately, you must decide whether Ronnie Fenderbender's insurance claim is approved or denied.

Name: _____

Activity 1: Data Sheets- **Known Slide Observation**

Slide 1. Bacillus bacteria (*Bacillus megatherium*)

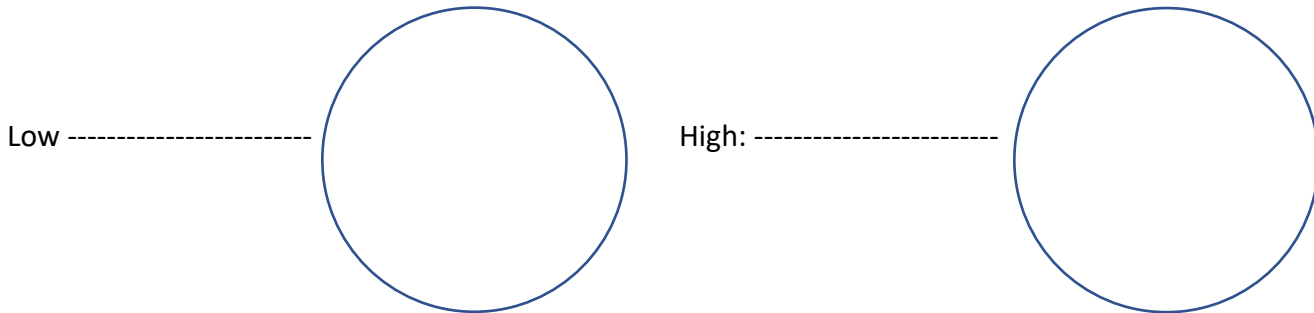
1a. Draw Slide 1 as viewed under both low and high magnification. Include the magnification and label the drawings as directed in the procedure.



1b. List distinctive features that might help you identify another organism as a similar bacterium.

Slide 2: Cyanobacteria (*Nostoc* sp.)

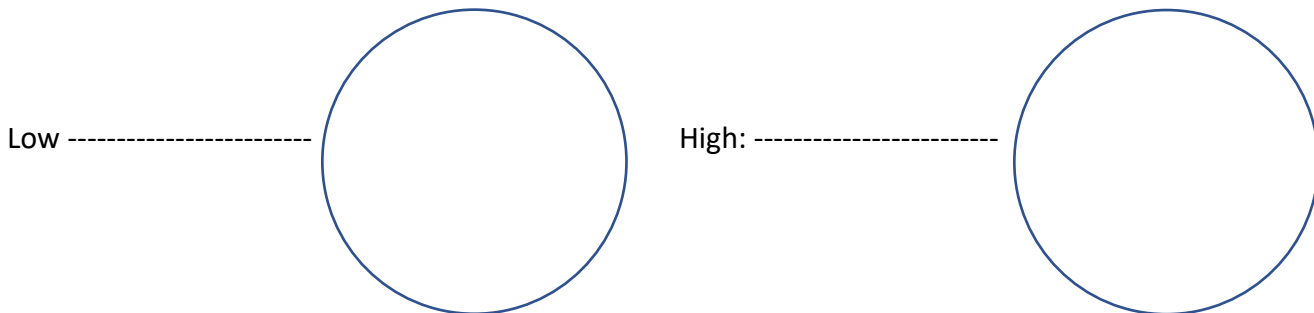
2a. Draw Slide 2 as viewed under both low and high magnification. Include the magnification and label the drawings as directed in the procedure.



2b. List distinctive features that might help you identify another organism as a similar cyanobacterium.

Slide 3: Amoeba (*Amoeba proteus*)

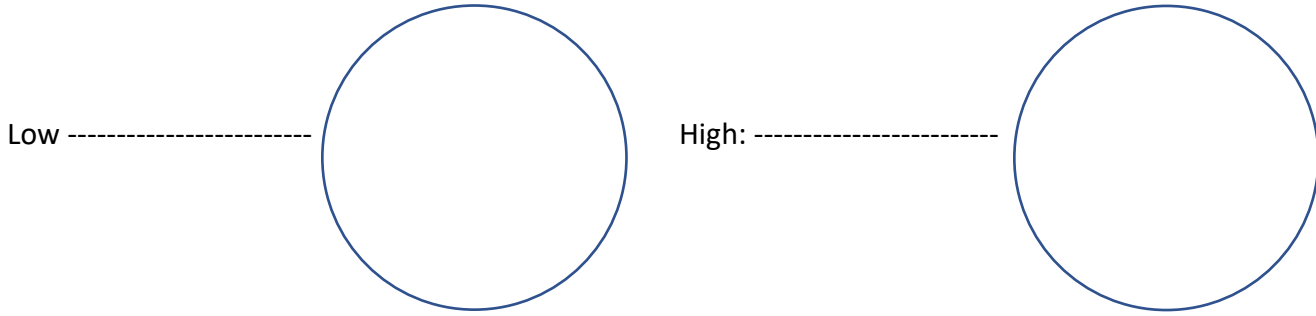
3a. Draw Slide 3 as viewed under both low and high magnification. Include the magnification and label the drawings as directed in the procedure.



3b. List distinctive features that might help you identify another organism as a type of amoeba.

Slide 4: Euglena (*Euglena* sp.)

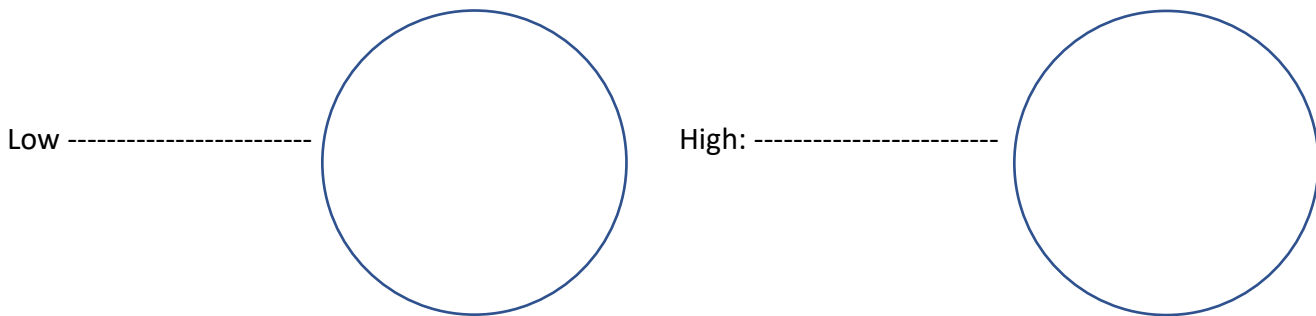
4a. Draw Slide 4 as viewed under both low and high magnification. Include the magnification and label the drawings as directed in the procedure.



4b. List distinctive features that might help you identify another organism as a type of euglena.

Slide 5: Privet leaf (*Ligustrum* sp.)

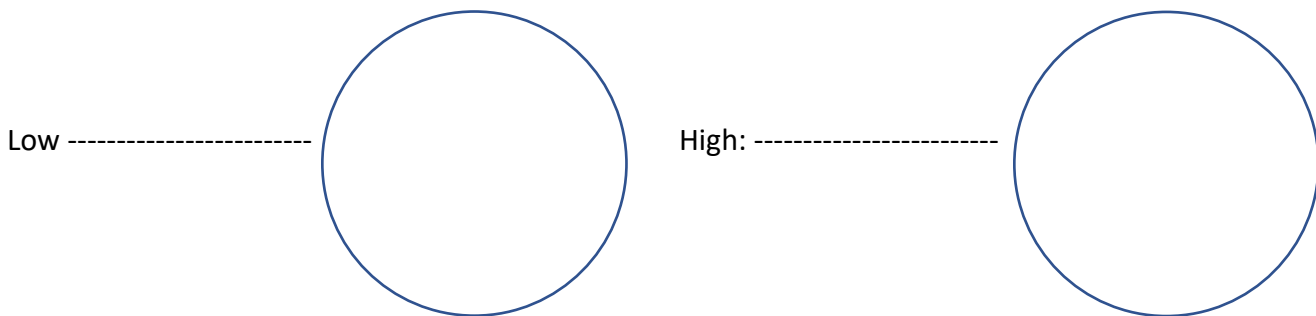
5a. Draw Slide 5 as viewed under both low and high magnification. Include the magnification and label the drawings as directed in the procedure.



5b. List distinctive features that might help you identify another plant leaf.

Slide 6: Corn stem (*Zea* sp.)

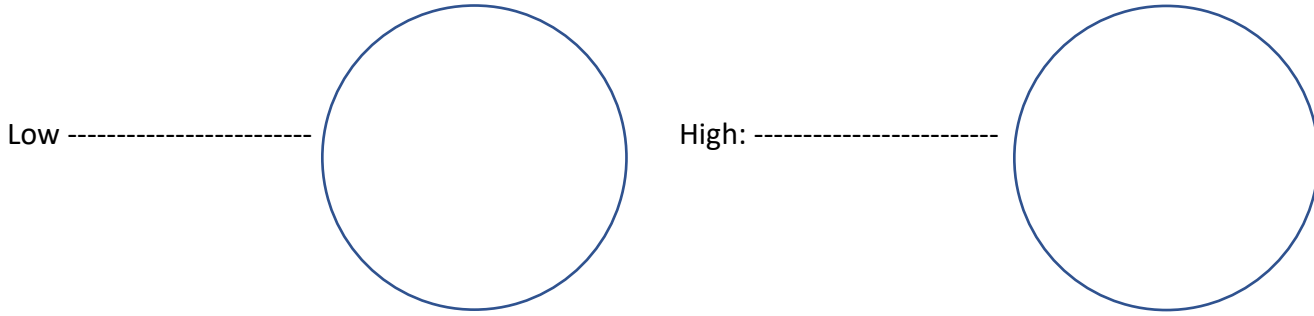
6a. Draw Slide 6 as viewed under both low and high magnification. Include the magnification and label the drawings as directed in the procedure.



6b. List distinctive features that might help you identify another plant stem.

Slide 7: Cheek Epithelium cell (human)

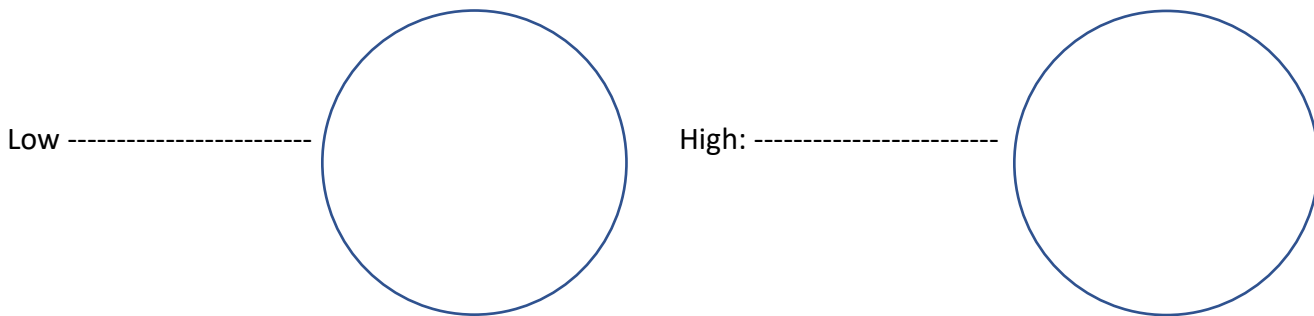
7a. Draw Slide 7 as viewed under both low and high magnification. Include the magnification and label the drawings as directed in the procedure.



7b. List distinctive features that might help you identify another similar animal cell.

Slide 8: Cardiac muscle (mammalian) / Intercalated Disks

8a. Draw Slide 8 as viewed under both low and high magnification. Include the magnification and label the drawings as directed in the procedure.

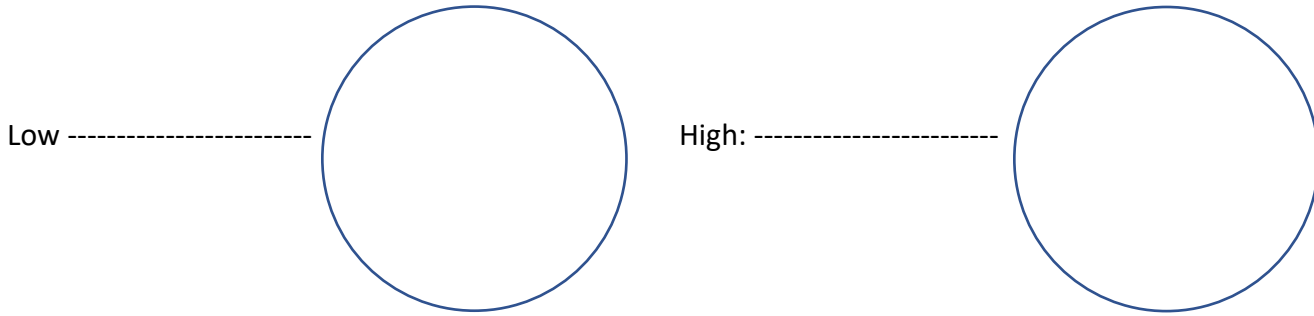


8b. List distinctive features that might help you identify another similar animal cell.

Activity 2: Data Sheets- **Unknown Slide Observation Report**

Unknown Slide 1

9a. Draw Unknown Slide 1 as viewed under both low and high magnification. Include the magnification and label the drawings as directed in the procedure.



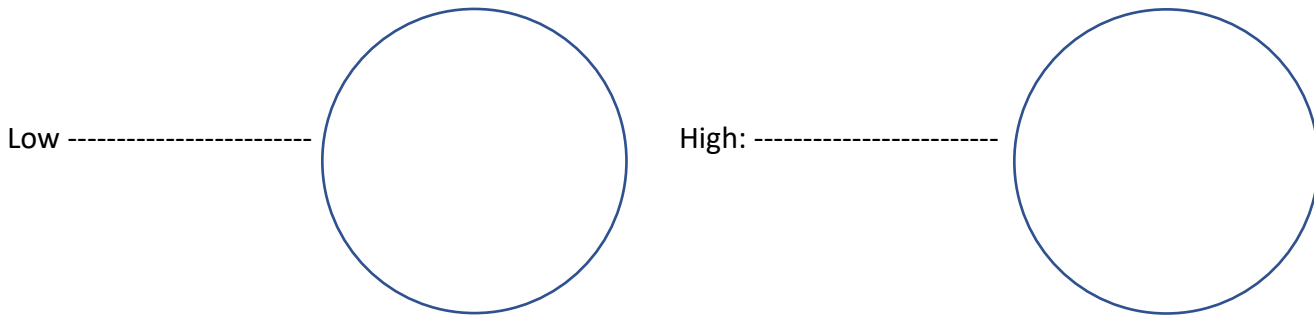
9b. Is this a bacterial, protist, plant or animal cell? _____

9c. Tell Clint, the claims assessor, how you identified this sample. Be as specific as possible.

9d. How do you think this sample came to be on the bumper of Ronnie's car?

Unknown Slide 2

10a. Draw Unknown Slide 2 as viewed under both low and high magnification. Include the magnification and label the drawings as directed in the procedure.



10b. Is this a bacterial, protist, plant or animal cell? _____

10c. Tell Clint, the claims assessor, how you identified this sample. Be as specific as possible.

10d. How do you think this sample came to be on the bumper of Ronnie's car?

11. Based on the two samples you have examined, make a recommendation either to approve or deny Ronnie's insurance claim. Give specific reasons for your recommendations. *Complete the form on the next page.

Claim: XJZ 389 775 201	Claims Assessor: Brody, Clint	Insured: Fenderbender, Ronald
Examiner:	Insurance Claim: Approved Denied	Recommendation Date:

Explanation Report: