

Microscope Mania

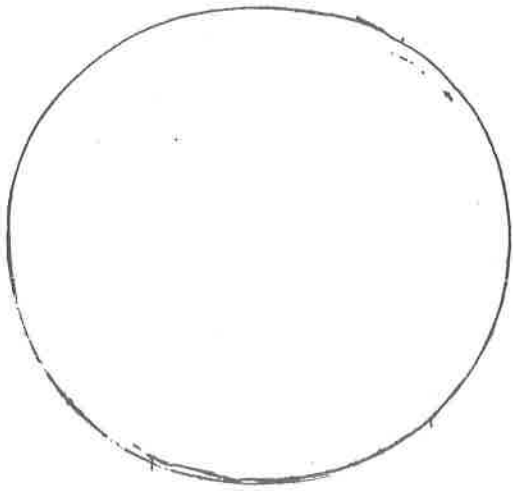
LAB PACKET

Name _____

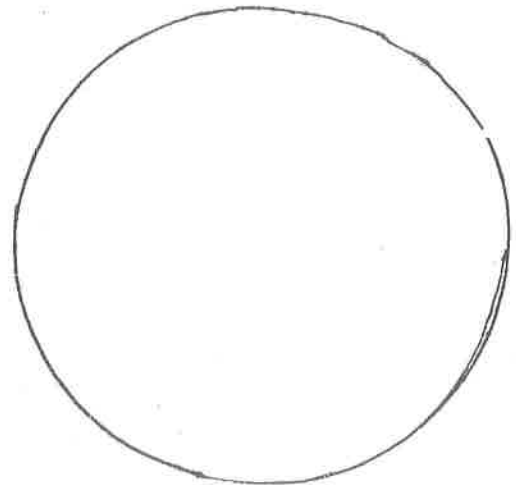
Date _____ Per. _____

STATION 1: VIEW YOUR OWN HAIR

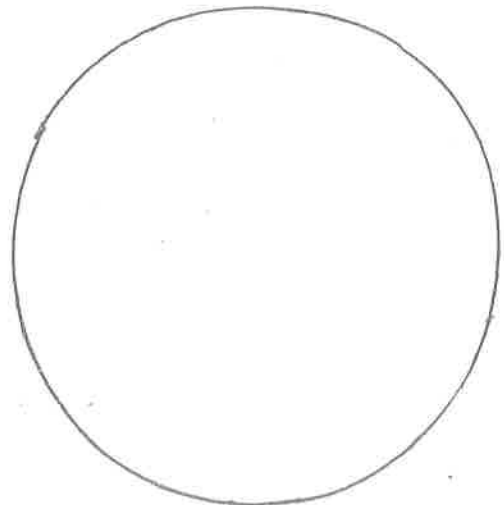
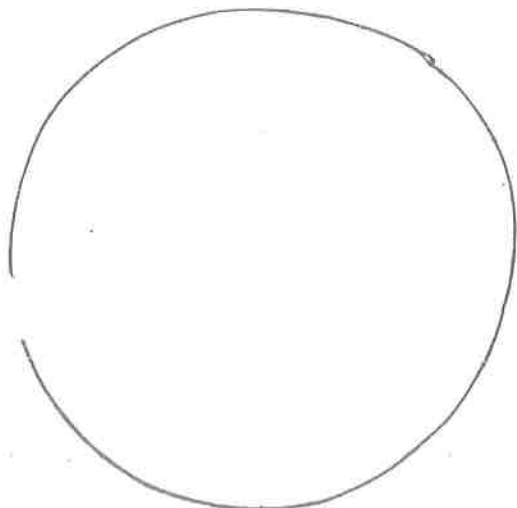
1. Remove one strand of hair from your head.
2. Place a drop of water in the middle of the slide and place the hair in the water droplet.
3. Place a cover slip on one side of the drop of water and lower it onto the drop of water.
4. Place the slide on the stage and adjust the focus knobs to bring the hair into focus.
5. Draw a picture of what your hair looks like using both the lowest power objective lens and the highest power objective lens.
6. If you choose to draw a partner's hair to compare, this will count as extra credit.



Total Magnification _____



Total Magnification _____



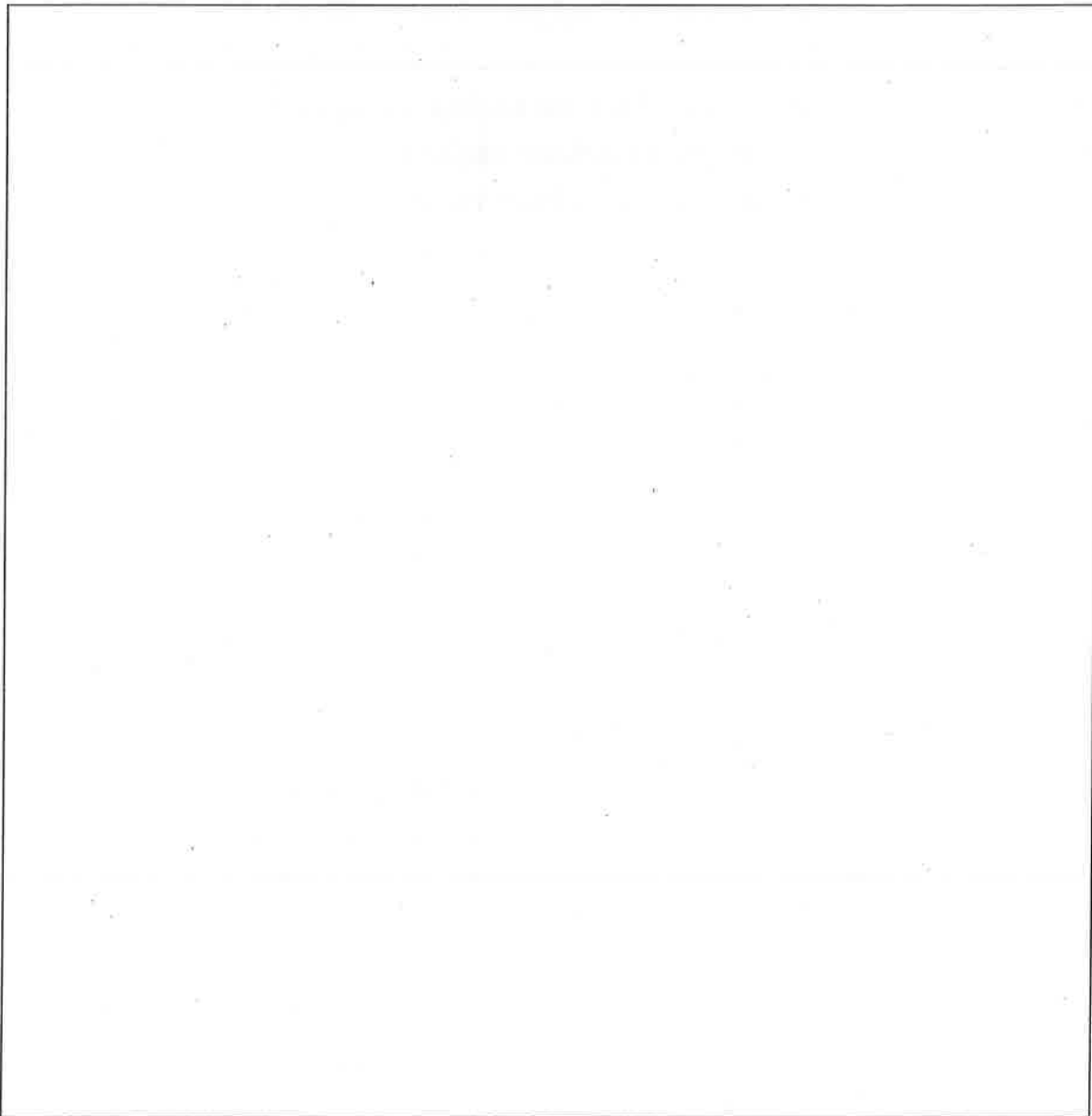
STATION ②

Build A Microscope With Words

Directions: "Build" a microscope with words. Draw a microscope by drawing "word pictures" for each part.

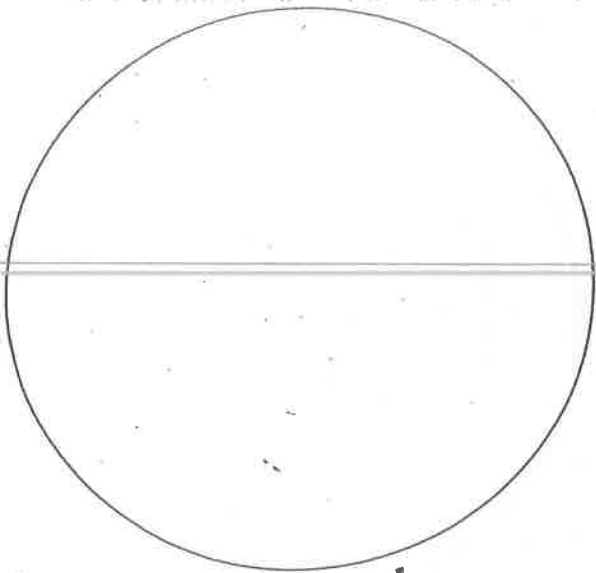
WORDS TO USE

Base, Stage, Light Source, Stage Clips, Diaphragm, Coarse Adjustment Knob, Fine Adjustment Knob, Body tube, Eyepiece, Nosepiece, Arm, Objective Lenses



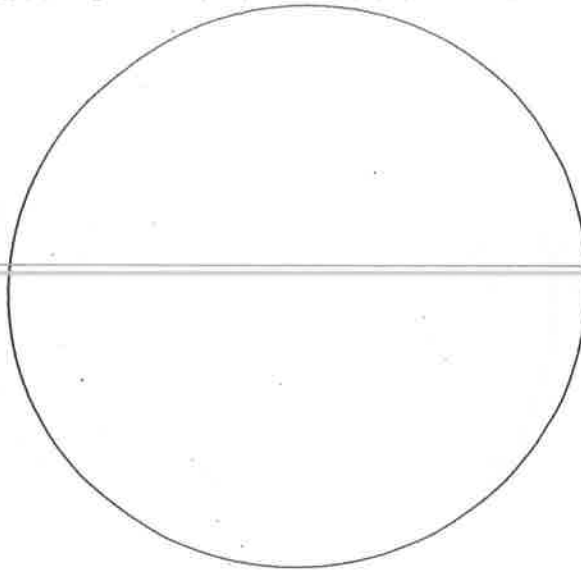
STATION 3

Microscope
Mania



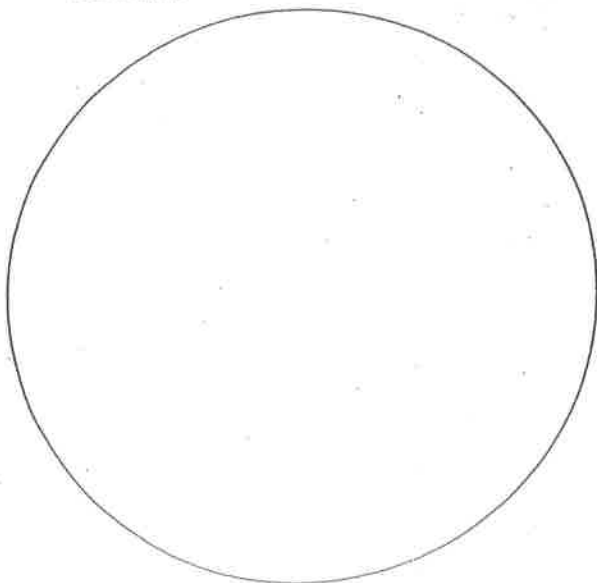
Name of Specimen _____
Magnification Power _____

Microscope
Mania



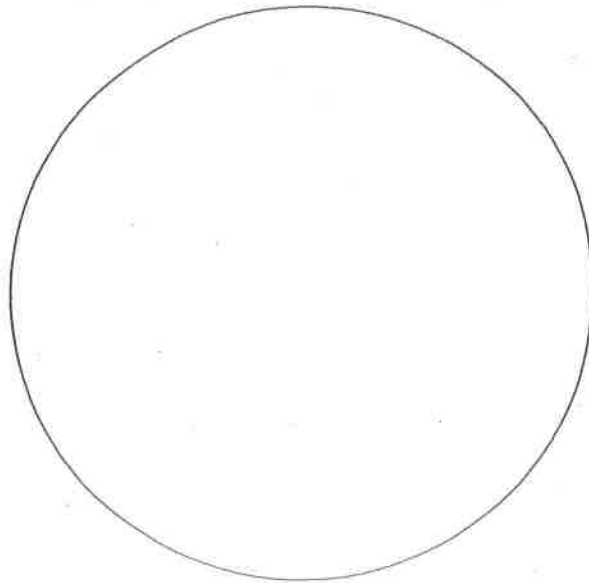
Name of Specimen _____
Magnification Power _____

Microscope
Mania



Name of Specimen _____
Magnification Power _____

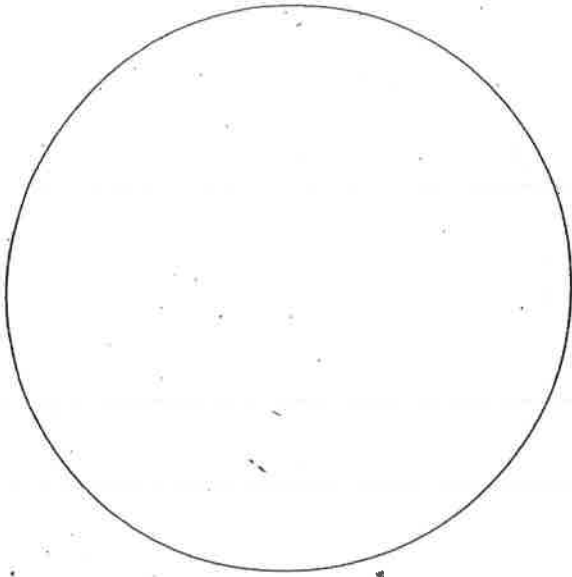
Microscope
Mania



Name of Specimen _____
Magnification Power _____

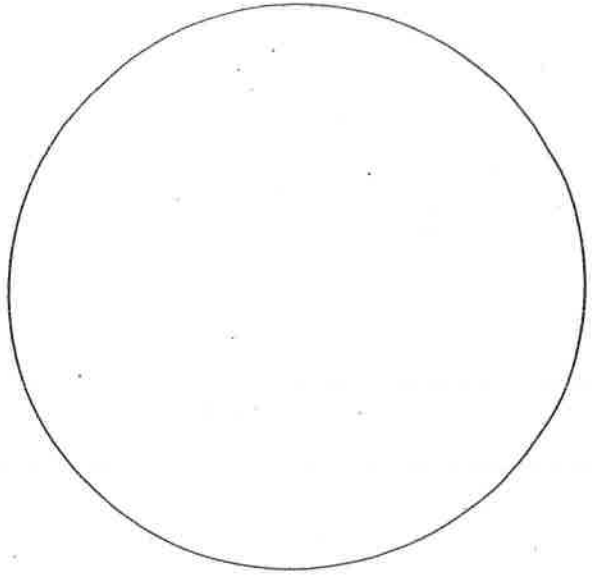
STATION (3)

Microscope
Mania



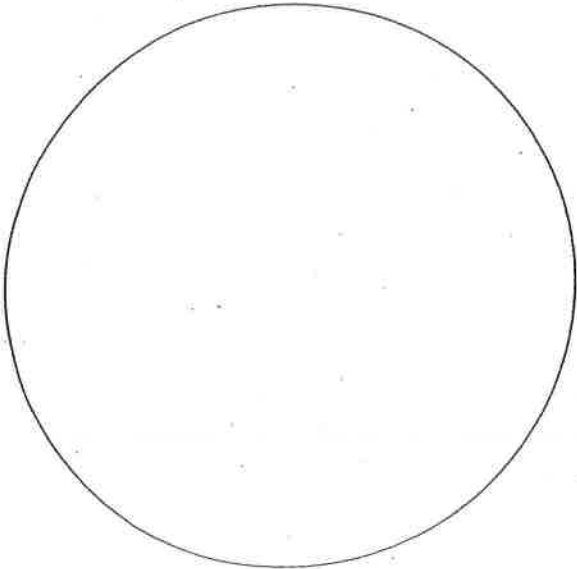
Name of Specimen _____
Magnification Power _____

Microscope
Mania



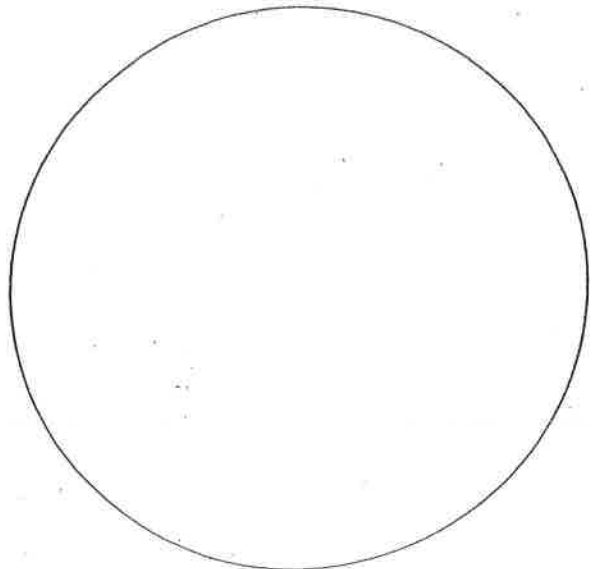
Name of Specimen _____
Magnification Power _____

Microscope
Mania



Name of Specimen _____
Magnification Power _____

Microscope
Mania



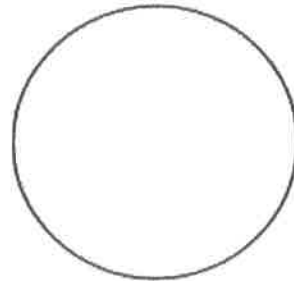
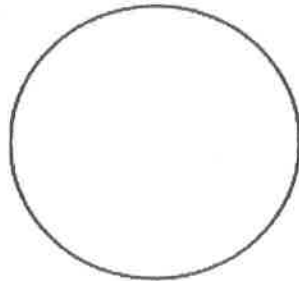
Name of Specimen _____
Magnification Power _____

Station 4: Observing the Letter E

1. Obtain a prepared slide of the letter e. Hold it up to the light. Sketch what you see in question 1 below.
2. Place the slide on the microscope stage just as you were viewing it in step 1. Using the lowest power objective lens, center the image and bring it into focus with the coarse adjustment. Make a sketch of what you see in question 1 below.
3. Move the slide to your right while looking at the image through the microscope. Note the direction that the image moves in the field of view. Answer questions 2 and 3.
4. Make sure that the letter e is in the center of your field of view and clearly in focus. Put the medium power objective in place. Focus until a clear image is visible. Answer questions 4 and 5.
5. Put the high-power objective in place. Bring the image into clear focus using the fine adjustment. Again, note the working distance. USE ONLY THE FINE ADJUSTMENT. Answer remaining questions.

Questions

1. Sketch the letter e. a. As seen with the unaided eye: b. As seen through the microscope:



- a. How does the position of the image appear when you compare these two sketches?
2. What direction does the image move in the field of view when you push the slide to the right?
3. What happens to the amount of light as you increase magnification?
4. What happens to the size of the field of view as you increase magnification?
5. Why is it important that the object is centered in the field of view before switching to a higher power objective?
6. Why is it crucial to use only the fine adjustment when the high-power objective is in place?



Exploring the Microscopic World



History

The compound microscope is one of the most useful instruments available to students of biology. The microscope has an interesting history, and has evolved from hand-held contraptions to more complex, freestanding models.

~~Hans and Zacharias Janssen, Dutch spectacle makers, are credited with making the first crude microscope around~~ 1590. Their microscope was 18 inches long and only 1 inch in diameter. It is not known whether the Janssens made any profound discoveries or observations with their microscope. Galileo, however, is said to have copied their idea for his own magnifying instruments, including his famous invention, the telescope.

These first crude microscopes had low magnifying power, yet the images they imparted of common objects were stunning to unsuspecting viewers. Galileo himself noted that his microscope “made flies look as big as lambs” (Magner, 1979).

Because fleas were readily available to early microscopists and were often the object of study, the name *vitrum pulicare*, or flea glass, was given to the microscope. But, as it is with many new scientific ideas and inventions, the microscope was not readily accepted throughout the educated community. Magner give this amusing account:

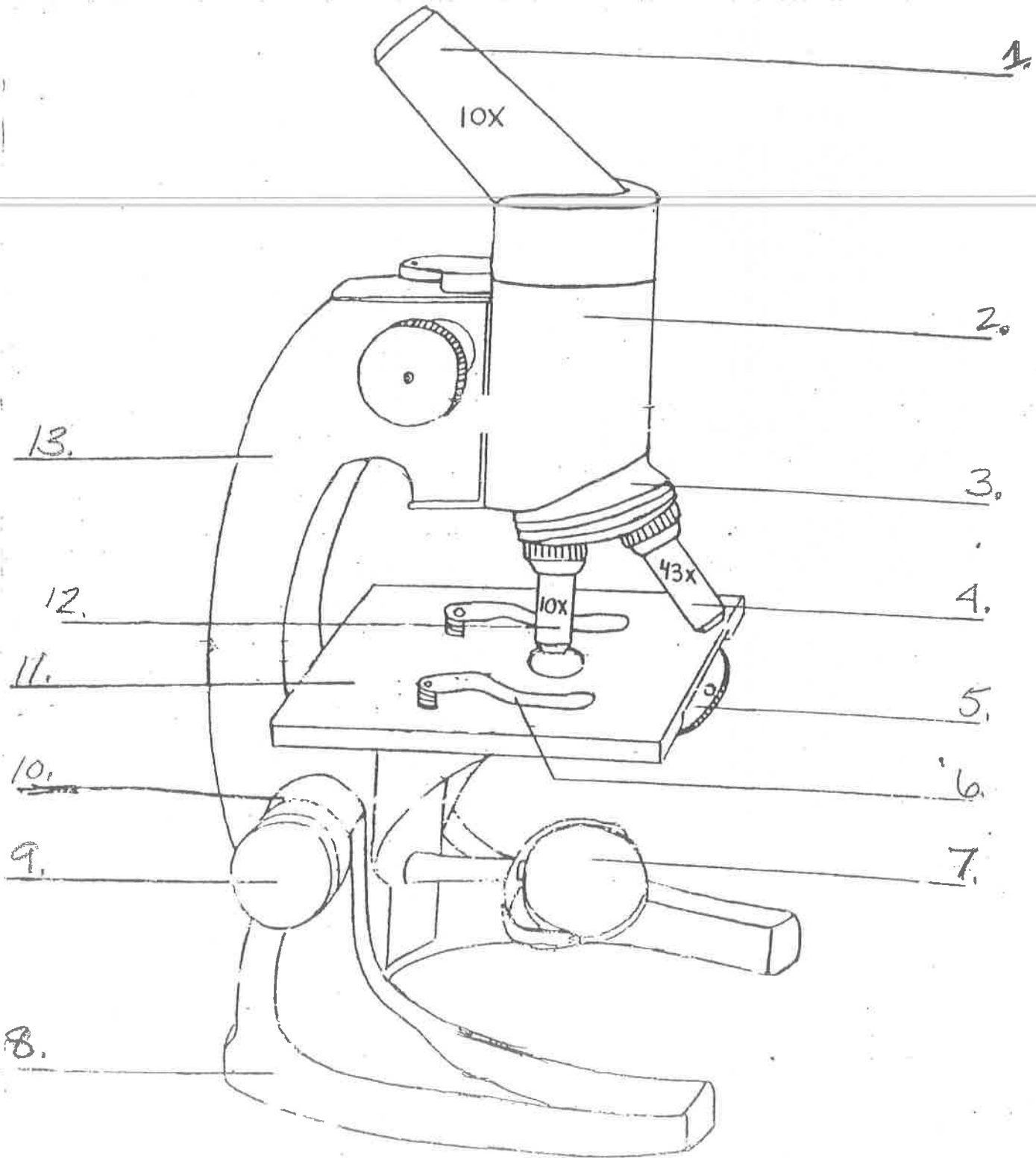
The very life of George Stiernhielm, a Swedish poet who amused himself with scientific experiments, was placed in jeopardy by the use of magnifying lenses. A Lutheran clergyman who had been persuaded to look at a flea through the magnifying glass was so frightened by the unnatural dimensions of the creature that he denounced Stiernhielm as a sorcerer and an atheist. Without the intervention of Queen Christina, the poet might have been burnt as a witch.

The scientist credited for being the greatest microscopist of the seventeenth century is Anton van Leeuwenhoek. Leeuwenhoek’s most famous works were the discovery of red blood cells, the study of insects, and his observation of sperm and ideas of reproduction. His work with parasites and bacteria were so advanced that they were not put to good use until 200 years later!

Questions:

1. Who is credited with making the first microscope?
2. Why were the first microscopes called “flea glasses”?
3. Who is considered the greatest microscopist (and who is now considered the “Father of Microscopy”) and why was he considered this?
4. Why do you think people may have been frightened by what they saw in a microscope?
5. If you could look at anything under a microscope what would it be and why?

PARTS OF THE MICROSCOPE



Label the Microscope Parts



Microscope Mania

Name _____

Find all the terms associated with the microscope.

D	C	B	R	S	Q	J	H	N	R	L	C	P	R	W	G	S	C	M	N	B	C
G	I	O	O	E	X	R	J	I	A	K	W	S	T	Y	T	O	I	L	L	O	C
L	M	A	N	N	C	S	S	E	G	L	G	X	T	A	L	R	A	U	A	O	T
K	A	Z	P	V	K	E	R	L	D	H	K	S	G	O	R	T	B	R	V	F	F
E	G	J	E	H	E	T	I	E	L	I	W	E	R	O	I	T	S	E	W	B	Q
O	N	E	N	L	R	X	N	P	S	E	L	X	R	G	H	E	R	I	B	Z	L
H	I	Q	O	W	N	A	L	E	E	A	C	S	I	G	A	S	P	Y	Q	X	W
N	F	C	K	I	Z	Y	G	E	M	Y	L	D	I	D	L	R	S	D	U	O	W
E	I	J	S	P	T	R	N	M	N	T	E	L	J	I	A	D	T	D	U	H	Y
W	C	L	K	O	Q	I	A	C	O	S	S	U	P	H	V	S	D	L	D	U	S
U	A	G	H	F	Z	R	O	P	J	Z	S	U	N	L	O	H	D	X	C	J	C
E	T	U	J	P	M	F	T	H	L	T	M	S	J	V	P	O	R	G	A	U	X
E	I	W	Y	S	S	I	H	B	M	I	V	K	T	D	O	N	K	E	O	G	E
L	O	O	K	R	C	N	N	E	C	W	S	L	E	A	A	E	O	E	T	P	Y
N	N	L	E	S	E	O	N	R	Z	N	G	A	W	C	G	E	L	T	K	A	E
A	E	W	B	S	R	T	O	U	Q	O	Q	I	M	L	E	E	N	I	W	E	W
V	O	A	S	T	K	S	W	X	A	P	H	L	T	G	Q	I	C	I	L	E	B
P	S	N	C	N	C	E	F	B	D	D	N	Q	P	I	G	S	P	L	F	A	N
E	A	E	O	O	R	R	E	C	R	U	O	S	T	H	G	I	L	E	I	T	G
J	L	B	P	C	O	M	P	O	U	N	D	L	I	G	H	T	X	R	S	P	M
E	P	E	O	B	J	E	C	T	I	V	E	L	E	N	S	E	S	J	K	O	S
P	H	O	T	O	M	I	C	R	O	G	R	A	P	H	Y	L	S	Q	J	J	N

- | | | |
|------------------------|----------------------|------------------|
| ARM | EYEPIECE | MIRROR |
| BASE | FINE ADJUSTMENT KNOB | NEWTON |
| CELLS | GALILEO | NOSEPIECE |
| COARSE ADJUSTMENT KNOB | HIGH | OBJECTIVE LENSES |
| COLOR | HOOKE | OPTICS |
| COMPOUND LIGHT | JANSSEN | PHOTOMICROGRAPHY |
| CONVEX LENS | LASERS | POWER |
| COVER SLIP | LIGHTBULB | SLIDE |
| DIAPHRAGM | LIGHT SOURCE | STAGE |
| DIGITAL | LOW | STAGE CLIPS |
| ELECTRON | MAGNIFICATION | VAN LEEUWENHOEK |
| EYE | MICROSCOPE | WATER |