Names: _____ _____

_____ _____

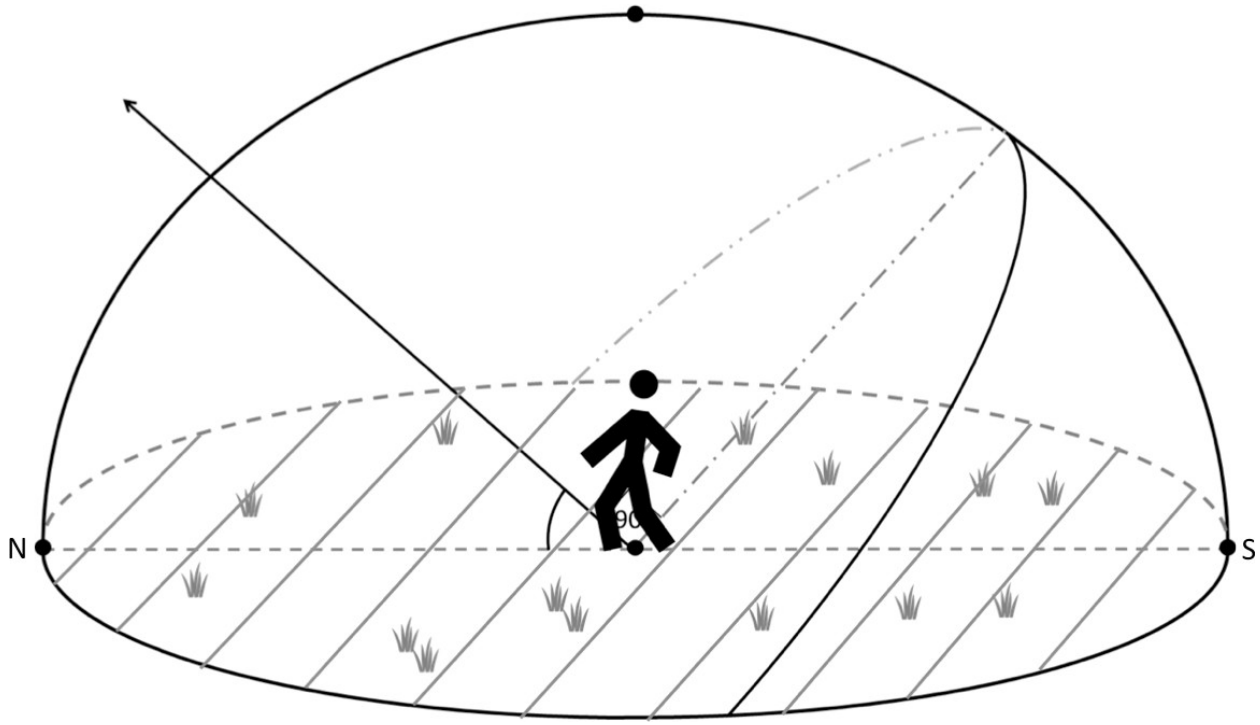
Grade	

Independent Research Project:
Workday 1

Pre-Lab Quiz

Record your team's answers as well as your reasonings and explanations.

1-4.



Part 1: The VAO and Target Selection

1. Using the internet for the first two columns and Stellarium for the last, fill in the chart below to determine some objects observable by the VAO tonight. Note that the VAO cannot see below 20° altitude. Some targets may not be observable at all; note this if so.

Object Name	Other Name (if Messier)	Object Type (star cluster, planet, galaxy, nebula, etc.)	Times Observable (dark sky, < 20°)
M42			
Saturn			
M16		emission nebula	
M57			
M27			
Jupiter			
M11			
M13			

2. List the targets in the table above that are observable during your lab meeting time. Research the objects on the list of candidate targets, picking one to be your final observation target. Every group in your lab must pick a different target, so make certain to discuss with the class. What target will your group observe for your Final Observing Project? Write a brief summary about it below, including details about its appearance and the type of object it is (open star cluster, globular star cluster, planet, emission nebula, planetary nebula, galaxy, etc.)

Observable Targets	Your Group's Target and Information

3. What kind of telescope is the Van Allen Observatory? Is this a reflecting or refracting telescope? Roughly sketch how light goes through this telescope to be focused on the camera.

4. Attend the tour and demonstration of the Van Allen Observatory and take some notes below.

Part 2: Selecting a VAO Filter

1. For each filter on the VAO given on the lab webpage, report its wavelength coverage (the starting and ending wavelengths). Is this filter a broadband or narrowband filter? Also approximate the central wavelength of the filter. What color of light does this filter correspond to in the electromagnetic spectrum?

Filter Name	Wavelength Range (nm)	Filter Type	Central Wavelength (nm)	Color
R				
G				
B				
H-alpha				

2. Why does the VAO have filters?

3. Choose your three filters to observe your final observation target in and list these below.

Part 3: CCDs and Selecting an Exposure Time

1. What is the pixel size of the CCD camera on the VAO? Compare this value to the widths of human hairs, whose diameters fall in the range of 20-200 microns (μm).

2. For an observatory, what does field of view (FOV) mean? What is the field of view of the Van Allen Observatory?

3. Select exposure times for each of your three filter choices and fill out the table below.

Filter	Exposure Time