

Name(s): _____

Date: _____ Course/Section: _____

Grade: _____

Introduction to Telescopes

Objectives:

Students will study telescope optics and assemble a simple telescope. Students will also learn how to set up and properly align a tripod-mounted telescope for nighttime viewing.

Checklist:

- Complete the pre-lab quiz with your team (if required).
- Compile a list of resources you expect to use in the lab.
- Work with your team to complete the lab exercises and activities.
- Record your results and mark which resources you used.
- Share and discuss your results with the rest of the class.
- Determine if your team's answers are reasonable.
- Submit an observation request for next week (if required).

Pre-Lab Quiz

Record your group's answers to each question, along with your reasoning. These concepts will be relevant later in this lab exercise.

1.

2.

3.

4.

Part 1: Finder Charts

1. Find a planet that will be visible in the night sky tonight and make a *finder chart* that will enable you to locate it at the best time for viewing.

A large, empty rectangular box with a thin black border, intended for the student to draw a finder chart for a planet.

Part 2: The Galileoscope

1. What are some of the differences between refracting and reflecting telescopes? (Drawing a diagram may be helpful.)

2. Is the Galileoscope a refracting or reflecting telescope? What kinds of celestial objects would you be able to see with it? What kinds of objects would not be ideal for observing with the Galileoscope?

3. What is an example of a reflecting telescope?

4. Why does the objective lens of the Galileoscope consist of two separate lenses fused together? You may need to research this answer.

5. Describe the view using the Galilean eyepiece. You should think about the magnification and the field of view. How do you think this would have affected Galileo's observations?

6. Describe the view using the modern lens and compare the magnification and field of view to the Galilean eyepiece. Do you notice anything else that is different with the modern lens?

7. Compare the view using the Barlow lens to that of the other two lenses. Explain the differences in field of view size, magnification, and any other parameter you may have noticed.

Part 3: Aligning an Equatorial Telescope

1. Equatorial telescopes have two axes, which one is aligned with the Earth's rotation axis.
2. Explain the purpose of the mounting wedge for this telescope.
3. Why is it better to choose a star near the celestial equator when aligning the right ascension axis of the telescope? (Hint: Draw a globe with lines representing right ascension and declination.)
4. Draw a sketch of the moon as it appears through the telescope. Label the important features.