QUESTBOARD #15 Optics Name:_____

Lenses: Telescopes

Objectives: - Use 2 lenses to build two different types of telescopes and calculate their magnification.

Keplerian Telescope:

Use two convex lenses, A and D, to make a telescope. Hold one lens very close to your eye and the other just beyond the first so you are looking through both. You may have to adjust them to get a focus. Look at an object across the room. Sketch and describe the object as it appears without the lens. Try drawing it at the same size as it appears. Next sketch and describe the image as it appears through the telescope. The easiest way to sketch to scale is to hold your thumb up and use that as a size reference for both the actual object and telescope image.

Sketch	**Describe**

Q1. What do you have to do to the lenses to get the image to be in focus?

Q2. Measure the size of your two pictures with a ruler and calculate how many times bigger the image is than the object. Take the average of the amounts found by all group members to get the average magnification. **Show All Work**.

Average Magnification = _____

Q3. What happens if you turn the telescope around and look through it backwards?

Gaussian Telescope:

Now use lenses B and E to make a telescope. Hold the concave lens very close to your eye and the convex lens just beyond the first so you are looking through both. Look at an object across the room. If you are having trouble, try looking at something a little closer. Sketch and describe the object as it appears without the lens. Try drawing it at the same size as it appears. Next sketch and describe the image as it appears through the telescope.

Sketch	Describe

Q4. Measure the size of your two pictures with a ruler and calculate how many times bigger the image is than the object. Take the average the amounts found by all group members to get the average magnification. **Show All Work**.

Average Magnification = _____

Q5. What happens if you reverse the order of the lenses so the convex lens is closer to your eye?