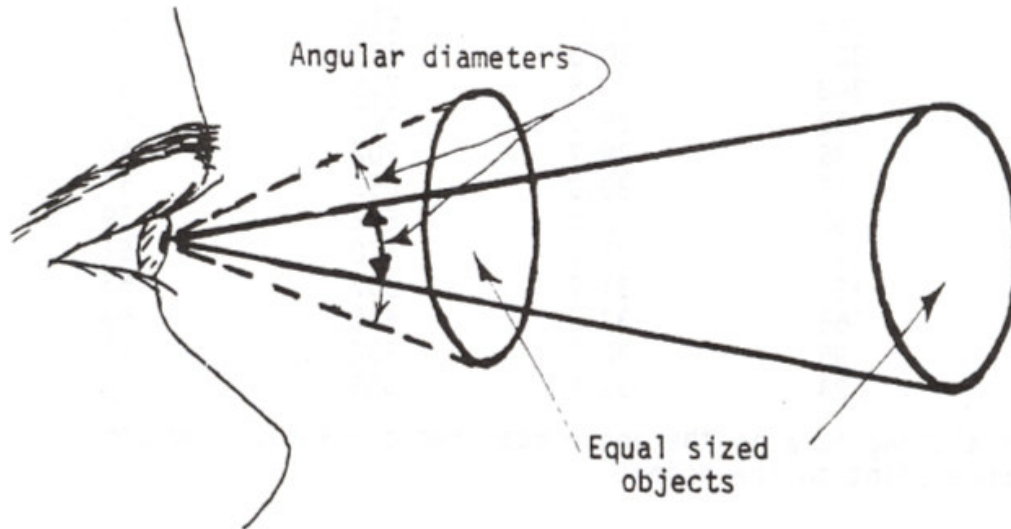


Introduction: The Moon is very often the brightest object in the night sky, yet it appears to change in appearance with regularity. Using the data concerning the moon's position, distance and appearance, you will investigate this change.

The angular diameter of an object is determined by measuring its apparent width in degrees. The angular diameter of an object can be measured without reference to distance. However, a change in angular diameter of an object means either the distance between you and the object is changing or the actual size of the object is changing. (See diagram)



Procedure:

1. Plot the location data (longitude and distance) of the Moon from the chart below on the polar graph paper. The central circle represents Earth's surface. Each major circle represents 100 units.
2. Show the direction of the Sun with an arrow for each of the dates given. Remember that the distance to the Sun is much greater than the distances from Earth to Moon, so parallel straight lines are the best representations of direction.

Data

Date	Celestial Longitude of Moon	Angular diameter of Moon	Distance from Earth	Celestial Longitude of Sun
5/1	185°	33.1'	629	40°
5/3	215°	33.2'	628	42°
5/5	244°	32.6'	638	44°
5/7	273°	31.7'	657	46°
5/9	299°	30.7'	678	48°
5/11	324°	30.0'	695	50°
5/13	348°	29.5'	705	52°
5/15	12°	29.5'	707	54°
5/17	36°	29.7'	702	56°
5/19	60°	30.0'	693	57°
5/21	85°	30.5'	682	59°
5/23	111°	31.1'	670	61°
5/25	138°	31.7'	657	63°
5/27	166°	32.3'	645	65°
5/29	195°	32.7'	637	67°
5/31	224°	32.8'	636	69°

Discussion questions:

1. How could you best describe the pattern of change of the moon's angular diameter over a long period of time?

2. If, as in the diagram, the observer remains stationary:
 - a. How would the angular diameter of the sphere change if it were one-half the distance shown in the diagram?

 - b. What do you think is the relationship between the Earth-Moon distance and the Moon's angular diameter as measured from Earth?

3. Indicate on the graph where the Moon will be when it is in:
 - a. Full phase
 - b. Quarter phases
 - c. New phase

4. At what locations might lunar eclipses occur?

5. Why is there not an eclipse every month?

6. Since the Sun appears to shift approximately 30 degrees each month, where will the *next* full moon be? Indicate it on the graph.

7. The Moon's period of revolution is 27.3 days. What is the time from one full moon to the next?

8. How does the Moon's orbit compare to a circular path?