

# Lap - lab report example



## Lap

Experiment #2: The Size of the Moon Viewing location and other present if any ment of Purpose: The purpose of the experiment is the measurement of the angular size of the moon. The angular size of the moon refers to the number of arc degrees the width of the moon occupies in the sky. This measurement is derived from measuring a covering circle and its distance from the observer, then applying that resulting angular size to the distance to the moon. The result is the moon's diameter. This measure is calculated twice, once with the moon low on the horizon, and once when it is higher in the sky to test the visual sensation that the moon is larger when on the horizon. Explanation of Procedure: A meter stick was mounted at slightly greater than eye level, level to the ground. A plumb bob, actually a string with a nut tied to the end, hung at head level exactly 0.5 meters from the meter stick. This served as an observation post with easily converted and consistent measures. As the moon fully rose past the horizon, two index cards were "butted" to either edge of the moon and the indicated length was recorded. This procedure was repeated later. Data and Calculations: The chart results: time d (cm) D (cm) conversion ? 7: 10 50 0.5 205265 2053 10: 10 50 0.5 205265 2053 Where: d= 50 cm as set by the experiment. D= the measure between the cards ?= the angle size of the moon in arc seconds calculated as  $\theta = (D/d) \times 205265$  The diameter of the moon is calculated as:  $D = (205265 \times 2053) / 380000 \text{ km}$   $d = 3800 \text{ km}$  The angular size of the moon by calculation is: 2053 arc seconds The estimated diameter of the moon is: 3800 km The angular size of the moon is consistent throughout a one night period; however, the distance to the moon varies over time, so over years,

the angular size changes

**Conclusions and Analysis:** The method used produces a good approximation of the diameter of the moon. The possible reasons for inaccuracy include: measuring to the millimeter with cards on a meterstick, the angle of the eye to the card if not dead center, the halo of the moon may make it appear wider, and environmental lighting conditions can change the perceived width. The calculations use an average distance to the moon rather than the exact distance, which is why the calculations are consistent, but inaccurate. The illusion of the moon changing size occurs because the horizon gives visual cues that make people think the scale of the moon is greater. Against a large tree, the moon looks wider. In the open, it doesn't appear to change much.