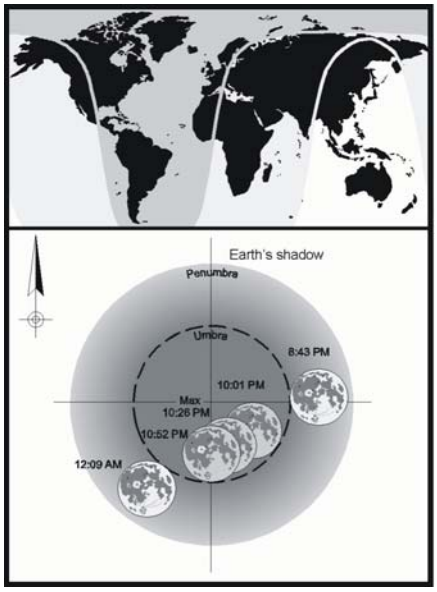
Student name: _____

Lunar Eclipse Observation

On the evening of February 20, the Moon will pass through Earth's shadow, bathing the lunar disk is an eerie lighting as we witness a total lunar eclipse. Lunar eclipses are like snowflakes, in that no two are ever the same. Each is unique in some way, thanks in large part to variations in the Earth's atmosphere and its influence on the appearance of our planet's umbral and penumbral shadows.



Coloration of the Earth's shadow, the result of sunlight refracting through our atmosphere, can change remarkably from one eclipse to another. At times, the shadow is a brightly colored orange-red, while at others, it appears a dark brown or grey. Still other eclipses have been recorded showing hints of purple, blue or even green in the shadow. Other variations to the shadow include changes to its basic curved shape, such as unusual "flattenings," notches, or even peaks.

As the Moon begins to move through Earth's shadow, we will begin to see more and more of the lunar disk covered in a dark gray shadow. Begin your observations of the partial eclipse at 8:30 p.m.

Location of observations (town): _____

Sky conditions: _____

1) The "partial eclipse" stages are due to begin at 8:43 p.m., but that moment is often difficult to predict precisely because of the shadow's "fuzzy" edge. Based on your observations, record the time that the partial eclipse began. _____

2) During that time, it is interesting to monitor the changing colors and any unusual irregularities in the umbra. Is the shadow homogenous and uniform, or irregular? Describe the appearance of the shadow at the following times:

   a. 8:45 p.m.: _____

   _____

   b. 9:15 p.m.: _____

   _____

   c. 9:45 p.m.: _____

   _____

3) Although it is due to occur at 10:01 p.m., the moment that the Moon is totally engulfed in Earth's shadow is also difficult to mark precisely. Based on your observations, record the time that the total eclipse began.

_____

4) One of the simplest and most telling total lunar eclipse observations is estimating the Moon's luminosity value at various times during totality. Early in the twentieth century, the French astronomer André-Louis Danjon devised a clever five-point scale for rating the darkness of a total lunar eclipse. The Danjon scale, reproduced below, has since gone on to become the standard by which all total eclipses are judged.

Danjon Lunar Eclipse Luminosity Scale	
L = 0.0	Very dark eclipse. Moon almost invisible, especially at mid-totality.
L = 1.0	Dark eclipse, gray or brownish coloration; lunar-surface details distinguishable only with difficulty.
L = 2.0	Deep red or rust-colored eclipse; central part in the umbra dark, but outer rim of the umbra relatively bright.
L = 3.0	Brick-red eclipse, usually with a brighter (frequently yellow) rim to the umbra.
L = 4.0	Very bright copper-red or orange eclipse, with a bluish, very bright umbral rim.

Although Danjon devised the scale to fit every lunar eclipse, it is rare for an eclipse to match one of his descriptions exactly. Instead, most seem to fall somewhere between two values - therefore, so should your estimate. For example, at mid-eclipse, if the Moon appears a muddy-clay color highlighted with a bright, almost yellow rim, then the Danjon luminosity value would fall somewhere between 2.0 and 3.0. After carefully examining the Moon's appearance, judge which description it most resembles, and then prorate the value accordingly. In this case, a luminosity value of 2.4 or 2.5 would seem most appropriate. Astronomical magazines always encourage readers to send in their observations and reports, but to be of real value, always include your time, location, instrument used, if any, and a description of the sky conditions.

Record your estimate for the eclipse's Danjon value at the times shown below:

Time	Danjon value
10:01 p.m.	
10:26 p.m.	
10:52 p.m.	

5) Finally, estimate the time that the total eclipse phase ends. The predicted time is 12:09 a.m. Your estimate:

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