

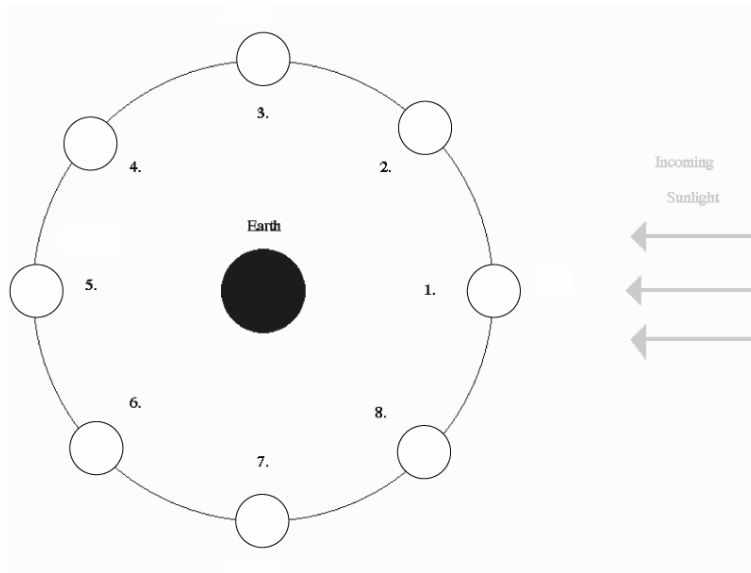
Lab 3

Phases of the Moon

Names: _____

Exercise 1 (10 points)

The figure below shows a “top view” of the Sun, Earth, and eight different positions (1-8) of the Moon during one orbit around the Earth. Note that the distances shown are **not** drawn to scale.



Ranking Instructions: Rank (from *greatest* to *least*) the amount of the Moon’s **entire surface** that is illuminated for the eight positions (1-8) shown.

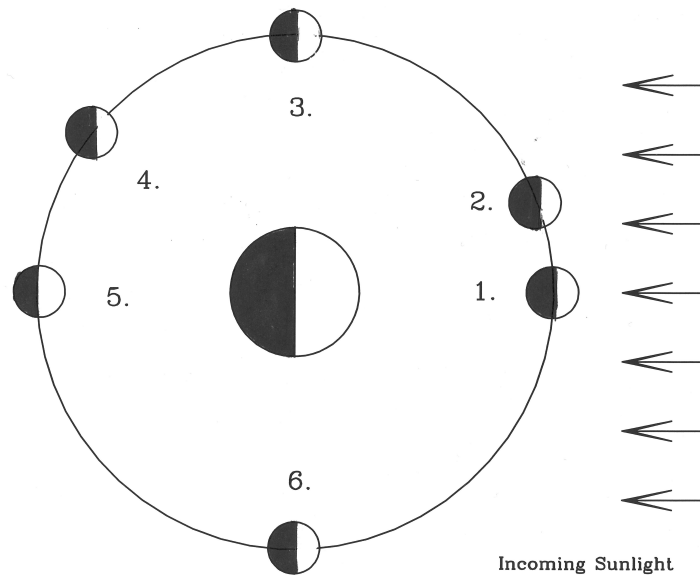
Ranking Order: Greatest A ____ B ____ C ____ D ____ E ____ F ____ G ____ H ____ Least

Or, the amount of the entire surface of the Moon illuminated by sunlight is the same at all the positions. ____ (indicate with a check mark).

Carefully explain the reasoning for your result:

Exercise 2 (10 points)

The figure below shows a “top view” of the Sun, Earth, and six different positions (1-6) of the Moon during one orbit of the Earth. Note that the distances shown are **not** drawn to scale.



Ranking Instructions: Rank (from *greatest* to *least*) the amount of the Moon’s illuminated surface that is **visible from Earth** for the six positions (1-6) shown.

Ranking Order: Greatest A _____ B _____ C _____ D _____ E _____ F _____ Least

Or, the amount of the Moon’s illuminated surface visible from Earth is the same at all the positions. _____ (indicate with a check mark).

Carefully explain the reasoning for your result:

Exercise 3 (10 points)

Shown below are different phases of the Moon as seen by an observer in the Northern Hemisphere.



A

B

C

D

E

Ranking Instructions: Beginning with the *waxing gibbous* phase of the Moon, rank all five Moon phases shown above in the order that the observer would see them over the next four weeks (write both the picture letter and the phase name in the space provided!).

Ranking Order:

1) Waxing Gibbous

2) _____

3) _____







4) _____

5) _____

Or, all of these phases would be visible at the same time: _____ (indicate with a check mark).

Exercise 4 (6 points)







In the set of figures below, the Moon is shown in the first quarter phase at different times of the day (or night). Assume that sunset occurs at 6 p.m. and that sunrise occurs at 6 a.m.

 <div>EAST SOUTH WEST</div> Time: _____	 <div>EAST SOUTH WEST</div> Time: _____
 <div>EAST SOUTH WEST</div> Time: _____	 <div>EAST SOUTH WEST</div> Time: _____
 <div>EAST SOUTH WEST</div> Time: _____	 <div>EAST SOUTH WEST</div> Time: _____

Instructions: Determine the time at which each view of the Moon would be seen, and write it on each panel of the figure.

Exercise 5 (6 points)







In the set of figures below, the Moon is shown overhead, at its highest point in the sky, but in different phases. Assume that sunset occurs at 6 p.m. and that sunrise occurs at 6 a.m.

 EAST SOUTH WEST Time: _____	 EAST SOUTH WEST Time: _____
 EAST SOUTH WEST Time: _____	 EAST SOUTH WEST Time: _____
 EAST SOUTH WEST Time: _____	 EAST SOUTH WEST Time: _____

Instructions: Determine the time at which each view of the Moon would have been seen, and write it on each panel of the figure.

Exercise 6 (6 points)

In the two sets of figures below, the Moon is shown in different parts of the sky and in different phases. Assume that sunset occurs at 6 p.m. and that sunrise occurs at 6 a.m.

 EAST SOUTH WEST Time: _____	 EAST SOUTH WEST Time: _____
 EAST SOUTH WEST Time: _____	 EAST SOUTH WEST Time: _____
 EAST SOUTH WEST Time: _____	 EAST SOUTH WEST Time: _____

Instructions: Determine the time at which each view of the Moon would have been seen, and write it on each panel of the figure.

Demonstrating Your Understanding of Lunar Phases (17 points)

After you have completed the six Exercises and are comfortable with Moon phases, and how they relate to the Moon's orbital position and the time of day that a particular Moon phase is highest in the sky, you will be verbally quizzed by your instructor (*without the Exercises available*) on these topics. You will use the dual-colored sphere, and the flashlight, and a person representing the Earth to illustrate a specified Moon phase (appearance of the Moon in the sky). You will do this for three different phases.