Solar system formation - lab report example

Science, Physics

Solar System Formation

Solar System Formation Lab Choose from (type in exactly) the following: new, 1st qtr, full, 3rd qtr, facing away from me, facing away from sun.

Now face the Sun so that it is noon where you live (on your nose). Hold the Moon in between you and the Sun. You are looking at the dark side of the Moon. What phase is the Moon in? _new_ Where is the far side of the Moon? Facing away from sun__

Now take the Moon through 1 complete month by moving it counterclockwise, held out at arms length, while rotating your body along with it.

Do the same procedure, but this time starting with a full Moon. Where is the dark side of the Moon now? Facing away from sun_ Where is the far side of the Moon? _facing away from sun_

Position yourself and the Moon so that the Moon is in its 1st quarter phase. Mentally note the Sun-Earth-Moon positions. Where is the dark side of the Moon? Facing away from sun Where is the far side of the Moon? Facing away from sun_

Position yourself and the Moon so that the Moon is in its 3rd quarter phase. Mentally note the Sun-Earth-Moon positions. The alignment different from that when the Moon is in its 1st quarter phase. Where is the dark side of the Moon? Facing away from sun. Where is the far side of the Moon? _facing away from sun_

2. Starting with a new moon (Sun-Moon-Earth alignment), rotate the Earth once. True or False: All locations on the Earth (ignore the N/S poles) see a new moon, or close to a new moon (that is, if we could actually “ see” a new

moon).

A) True

B) False

3. Keep stepping through this process (rotate Earth once, move the Moon 12 degrees) until you get to the first quarter moon (7. 5 rotations of the Earth).

True or False: All locations on Earth see a 1st quarter moon, or close to it over the course of 1 rotation of the Earth.

A) True

B) False

4. Move the Moon and rotate the Earth until the alignment is Sun-Earth-Moon (Moon on the “ Day 15” mark).

What is the phase of the Moon?

A) new

B) waxing crescent

C) first quarter

D) waxing gibbous

E) full

F) waning gibbous

G) third quarter

H) waning crescent

5. Continue another 7. 5 days or 12 degrees of the Moon’s orbit. What is the phase of the Moon?

A) new

B) waxing crescent

C) first quarter

D) waxing gibbous

E) full

F) waning gibbous

G) third quarter

H) waning crescent

6. Align the Earth, Moon, and “ Sun” so that the Moon is in its first quarter. Keeping this set up, rotate the Earth so that it is sunset where you live. Where is the Moon located in the sky?

A) In the west, next to the Sun

B) In the south, on the meridian

C) In the east, just rising

D) the Moon is not visible under this condition

7. At what time does the first quarter moon set? [When will it be on the western horizon?]

A) approximately 6 hours after the Sun sets

B) approximately 12 hours after the Sun sets

C) approximately 6 hours before the Sun rises

D) the same time that the Sun sets

8. Align the Earth, Moon, and “ Sun” so that the Moon is full. Keeping this set up, rotate the Earth so that it is dawn where you live. Where is the Moon?

A) setting in the West

B) rising in the East

C) in the south, on the meridian

D) not visible under these conditions

9. Align the Earth, Moon, and “ Sun” so that the Moon is in its third quarter.

Keeping this set up, rotate the Earth so that it is dawn where you live. Where is the Moon located in the sky?

A) in the east, with the Sun

B) in the south, on the meridian

C) in the west, just setting

D) it is not visible under these conditions

10. At what time does the third quarter moon set?

A) sunrise

B) noon

C) sunset

D) midnight

11. The Earth spins on its axis once every 24 hours, making our day 24 hours long. We will loosely define a day as the length of time it takes the Sun to return to the same place in the sky at a given location. In Earth days, how long is a day if you lived on the Moon? Is the dark side of the Moon always dark? Explain.

Response

] 720hours. It is not always dark! One complete rotation of the moon round the earth takes approximately 30 days. Thus, 30 days multiplied by 24hours = 720 hours. The moon reflects the light of the sun to the earth as it revolves and the side which is not stricken by the light does not reflect this light and hence the dark side of the moon but in real sense it is not dark but failed to receive light to reflect at a given phase.

12. Which of the following could never happen?

A) An observer seeing a full moon in the middle of the day (local noon)

B) An observer seeing a new moon in the middle of the night (local midnight)

C) Both of the above observations are impossible for any observer to see.

13. No need to submit your sketch! Could you show how and when any given phase of the Moon (not an eclipse of the Moon) could be caused by the shadow of the Earth? Explain.

Response

Waxing gibbous phase could cause partial lunar eclipse especially SE of the Earth.

14. Choose from: WNW, WSW, SSW, SSE, ESE, ENE, NNE, NNW. For science, it is sufficient to note just one observation that negates this " shadowed Moon" idea to have the hypothesis disproved. Figure 2 shown below is an observation that does just that. The phase is waxing crescent and the Sun is still up, located in the WNW. The Moon is in the SW sky. The shadows of those trees in the image must point in which direction? __SSE_____ . The shadow of the Moon must then point parallel to the__ESE__ direction. Thus, the shadow of the Earth must point___SSW__it .

15. State how this observation disproves the " shadowed Moon" hypothesis?

Response

The shadowed moon hypothesis states that it can occur only when the Sun, Moon, and Earth are aligned exactly, or very closely so, with the Earth in the middle. Thus, only occur the night of a full moon. In this case partial darkness not necessarily cased by the Earth's shadow onto the moon but sizeable portion of the moon not receiving sun's rays due to its orientation in respect to the sun.

16. Starting with " J" (a new moon), put the phases in order, from new moon to full moon to new moon again.

Response

__J__ E_____B _____G _____D _____ I_____H _____K ___J__