coming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of

the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new

moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a

direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight

line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calen coming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun

and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon.

When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is

tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused

by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calen

coming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight

line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun

and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon.

When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is

tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused

by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calen coming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight

line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun

and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon.

When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is

tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused

by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calen

coming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of

the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new

moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a

direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight

line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun

and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calen coming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon.

When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is

tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused

by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight

line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calen

coming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun

and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon.

When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is

tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused

by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calen coming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight

line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun

and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon.

When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is

tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused

by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calencoming in from the right. One can see, for example, that the full moon will always rise at sunset and that the waning crescent moon is high overhead around 9:00 am local time.

Lunar phases are the result of looking at the illuminated half of the Moon from different viewing geometries; they are *not* caused by the shadow of the Earth or umbra falling on the Moon's surface (this occurs only during a lunar eclipse).

The Moon exhibits different phases as the relative position of the Sun, Earth and Moon changes, appearing as a full moon when the Sun and Moon are on opposite sides of the Earth and as a new moon (dark moon) when they are on the same side. The phases of full moon and new moon are examples of syzygies, which occur when the Earth, Moon, and Sun lie (approximately) in a straight line. The time between two full moons (a Lunar month) is about 29.53 days[1] (29 days, 12 hours, 44 minutes) on average (hence, the concept of the time frame of an approximated month was derived). This synodic month is longer than the time it takes the Moon to make one orbit around the Earth with respect to the fixed stars (the sidereal month), which is about 27.32 days.[1] This difference is caused by the fact that the Earth-Moon system is orbiting around the Sun at the same time the Moon is orbiting around the Earth.

The actual time between two syzygies or two phases is quite variable because the orbit of the Moon is elliptic and subject to various periodic perturbations, which change the velocity of the Moon. When the moon is closer to the earth, it moves faster; when it is farther, it moves slower. The orbit of the Earth around the Sun is also elliptic, so the speed of the Earth also varies, which also affects the phases of the Moon.[2]

It might be expected that once every month when the Moon passes between Earth and the Sun during a new moon, its shadow would fall on Earth causing a solar eclipse. Likewise, during every full moon one might expect the Earth's shadow to fall on the Moon, causing a lunar eclipse. Solar and lunar eclipses are not observed every month because the plane of the Moon's orbit around the Earth is tilted by about five degrees with respect to the plane of Earth's orbit around the Sun (the plane of the ecliptic). Thus, when new and full moons occur, the Moon usually lies to the north or south of a direct line through the Earth and Sun. Although an eclipse can only occur when the Moon is either new or full, it must also be positioned very near the intersection of Earth's orbit plane about the Sun and the Moon's orbit plane about the Earth (that is, at one of its nodes). This happens about twice per year, and so there are between four and seven eclipses in a calen