



# Sundials 101

—  
Practicing for  
Perfection

# For An In-Depth Study

- [Covenant Calendar Club | 1.11 The Tequfah Unveiled \(studythecalendar.com\)](http://studythecalendar.com)



## WHAT ON EARTH IS A TEQUFAH?

- The **Tequfah** is actually a Celestial Event designed by **Yahuah** as a sign for determining time.
- The **Tequfah** does not rely solely on a single orb but is a combination of multiple identities in the vast shamayim (heavens).

## A TEQUFAH IS KNOWN IN ENGLISH AS AN – EQUINOX.

- There are 2 **Tequfah** - (equinoxes) within one year. The first event is the spring **Tequfah** which occurs on either March 19, 20 or 21 (Gregorian). [The dates being used here are calculated from the Universal Coordinated Time (UTC) zone. These dates need to be adjusted according to the location of where one lives on this earth. More about UTC later in this presentation.]
- The most common date is the 20<sup>th</sup>, then the 21<sup>st</sup> and more rarely, the 19<sup>th</sup> of March (Gregorian).
- The autumn **Tequfah** occurs on and around September 23 (Gregorian).
- The **Tequfah** is very commonly **mistaken** as the - **Equilux**.

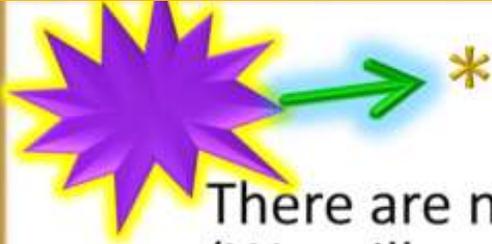
- At tequfah, the sun rises due east and follows a perfect arc setting due west, measurable on a sun dial, over the length of the equator within one 24 hour cycle.
- Any deviation from this perfect arc, is measurable on a sun dial by the visibility of a shadow \* on a properly installed sun dial (note – James 1:17 next slide).
- A **tequfah** (equinox) consists of basically 4 identities.
  1. Earth
  2. **Light** 
  3. Sun
  4. Mazzaroth Stars

In Him was Hai [Life], and the Hai was the **Light** of men. John 1:4

This **combination of celestial identities** permits a visible sign necessary for man to determine time as designated in the Scriptures of **Yahuah**.

Please note this **combination of identities**, approved and designed by **Yahuah**, prevents man from identifying one celestial creation of **Yahuah** for worship purposes. **Yahuah** has purposely built in a preventative maintenance situation, - **a combination of celestial identities -**  
TO PREVENT SUN WORSHIP. Let us Praise Yahuah for His infinite wisdom –

**Hallelu-Yah!** 



\* Noting the asterisk on the last slide about the shadow ...

There are numerous types of sundials and sun clocks.  
(We will not go into details in this study.)

**Tequfah Conditions:** The sun rises due east and sets due west without deviation.

During the **tequfah sign** event, on one style of sun dial, there will be **NO SHADOW** on the face of the sun dial during a few minutes while the sun is directly overhead.

On another type of sun dial, with the same celestial conditions, the shadow will demarcate a **perfectly straight line** during the **tequfah sign**. This type will expose a **curved shadow line** deviating from the perfectly straight line **before** and **after** the **tequfah sign**.



# Why is watching for this Tequfah sign event Important?

- Scriptures tell us in Isaiah 14:12-14 there is an adversary who WILL attempt to usurp our worship to Yahuah, on the moedim, for himself. If we are to be the Bride of Yahusha, it is imperative we not miss the wedding banquet because we did not show up on His appointed time.
- Because of this knowledge, “it is of the most importance to know what Scripture declares as the authentic beginning of Yahuah’s Worship Year”
  - **Isa 14:12** “How you have fallen from the heavens, O Hēlēl,<sup>c</sup> son of the morning! You have been cut down to the ground, you who laid low the nations! “For you have said in your heart, ‘Let me go up to the heavens, let me raise my throne above the stars of Ēl, and let me sit in the mount of appointment on the sides of the north; let me go up above the heights of the clouds, let me be like the Most High.’”

- According to Rabbinic's and Karaites, the equinox is defined as the time of equal day and equal night hours and that cannot be objectively "observed". Furthermore, they argue that the ancient Israelites had *no ability or technical knowledge to be able to accurately identify the day of the equinox*. In addition, they argue the equinox has only been identifiable through modern astronomy science. Consequently, they argue that the equinox therefore cannot be used as the accurate anchors of the biblical calendar.
- Interestingly, some Messianic sites, in their wisdom, similarly proclaim that the equinox was simply too complex for the ancients to be able to precisely identify and observe the day of the equinox and that understanding the word "tekufa" as referring to the equinox and the astronomical sun is an anachronism
- Thus, when Judah's mystics define the equinox in their broad terms of the equal day / night hours – which by scientific quality is properly termed the "equilux" – which is relative according to one's *latitude* across the globe, then they are indeed correct in saying this point is not readily measurable and identifiable as one specific day or point in time across the globe. This is because the measurement of the equilux is highly dependent on one's position (latitude) on the globe.

- However, in contrast to the “equilux”, the actual physical earth day of the astronomical equinox can indeed be readily identified, regardless of the latitude one is positioned at across the globe. The fact that it is so readily identifiable identifies and reveals that the contemporary argument that it was an impossibility for the ancient Israelites to have had the knowledge or technology to be able to make this identification, (and thus they argue it is to be regarded as an *anachronism* regarding the theology of the biblical calendar), rather indicates the complete arrogance and ignorance of modern scholars of religion, rather than the historical ignorance of the ancients. This is just another indication of the complete oblivion of the ancient memory regarding the “ancient paths” of biblical truth!
- Indeed, the Hebrew word “Tekufa” – referring to the “circuit of the sun” is accurately pointing to a definition of a precise astronomical point in time where the sun in its solar circuit is positioned in relation to crossing the earths’ equator, ~~or in real physics it marks the point at which the earth in its orbit around the sun changes from one agricultural season of winter to spring and summer to autumn, rather than the definitions the religious would have many believe as meaning a time of equal day and night hours.~~ (Which by the way is the precise meaning of the Roman term “equinox”). So, it is interesting that the religious employ a traditionally Roman definition of the term rather than a biblical or physical truth definition for the astronomical point of the sun crossing the equator, marking the physical changes in the seasons.

We need to remember also that awareness of the equinox (Tequfah) was also matter of a nations' very survival and economic well being since it gave precise indications of the agricultural calendar and the changes in the seasons and the times for preparing for sowing and reaping.

Using a very simple methodology one can practically observe and precisely identify the exact day of the Vernal and Autumnal equinoxes (Tequfah) with one's own eyes!

Religious theologians argue that using the equinox is not acceptable and must be ignored, because 1) the ancient peoples simply didn't have the ability or technology to do this and 2) because they claim that the days of the equinoxes are not practically observable for reasons that they confusingly define the equinox as the equilux... however creation around us – the heavens and the earth – the plants, the birds and the weather – testify quite a different message for those who have some wisdom and understanding to be able to watch and observe!

YHVH states the heavens declare the glory of YHVH and the whole of creation on the earth below knows this, demonstrates this and responds to the perfect points of the “circuit of the sun” (the “tekufa”) in its equinoxes which mark the precise turning of the seasons.

Creation seems to be telling us that when men are motivated to re-define the biblical calendar which is intimately linked to creation, however sincerely they may describe their attempt, the result is but to impose a dark age.

**[How To Precisely Observe The Astronomical Equinox – inthatday.net](http://inthatday.net)**

THE **ADVERSARY'S COUNTERFEIT** WORSHIP CALENDAR –  
*REFLECTIONS OF HIS GARDEN OF EDEN MESSAGE!*

The Father of Deception tolerates – **IF WE MUST OBSERVE THE MO-EDIM**  
– **AS LONG AS WE OBSERVE THEM ON HIS COUNTERFEIT CALENDARS.**

These counterfeit calendars facilitate the Adversary in **USURPING** our  
righteous intention of worshipping our Creator. Counterfeit calendars  
**REDIRECT** our heartfelt worship to the **Father of Deceptions!**

Ha Satan has re-designed and declared the lunation of the moon **peripheries**  
to be only fractionally off from **Yahuah's shaneh** months! They are only  
fractionally out of synch with the designated timeframes created and  
imposed by **Yahuah!** The word – **camouflage** – comes to mind here.

# HOW DO WE MARK THIS SIGN?

**Azimuth**

**OR**

**Altitude**



# Azimuth Sundials

Azimuth is defined as an angular measurement in a spherical coordinate system. This angular distance or measurement is basically the direction of a celestial object from the point of the observer.

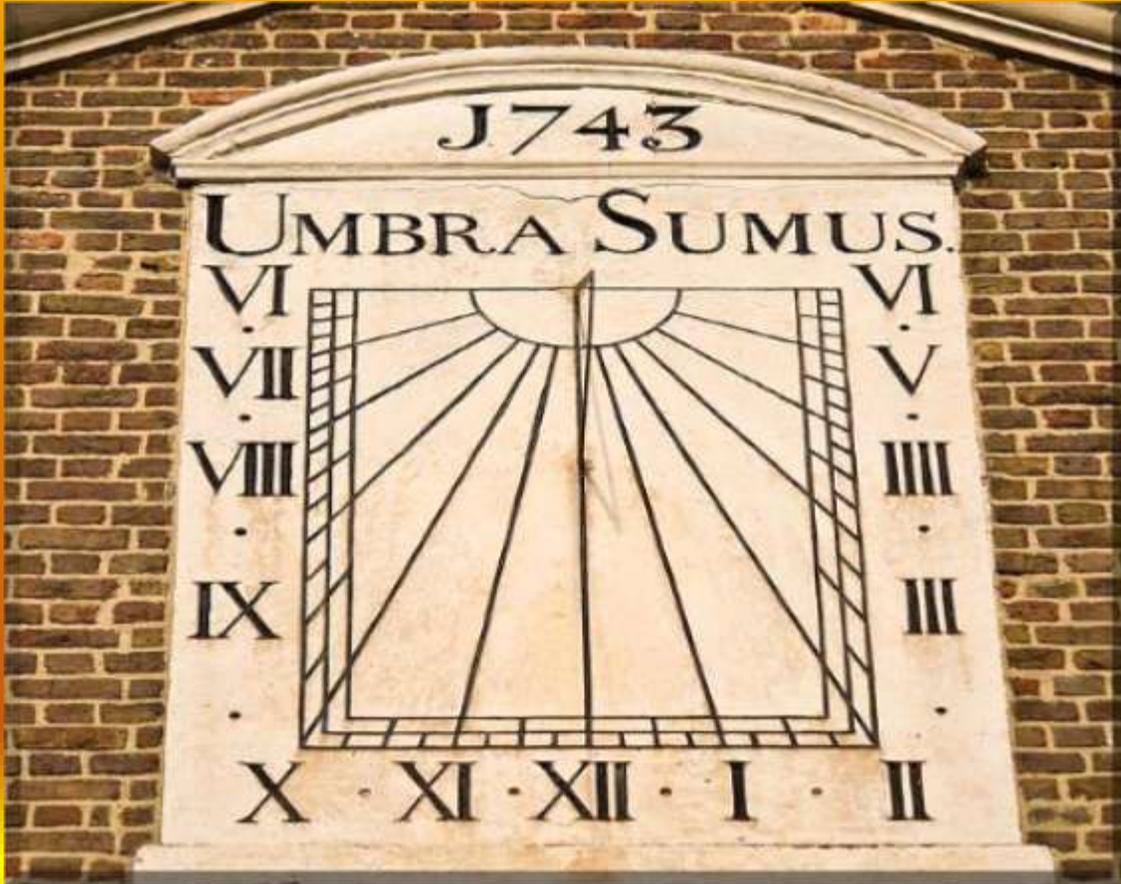
Azimuth sundials help determine the time from the sun's angle on its daily arc. In other words, they indicate the time by using the sun's direction to do so. There are different types of Azimuth dials that tell the time with the help of the hour angle of the sun.

# Horizontal Dial



- ❖ Most common sundial; it has the ability to tell the time whenever the sun is shining, primarily because the dial plate lies flat on the ground in a horizontal manner.
- ❖ Largely characterized by its prominent flat-shaped dial plate.
- ❖ It has three main parts: the gnomon, the hour markers, and the faceplate. The gnomon is the vertical part of the sundial that casts a shadow in order to tell time; the hour markers show the time on which the shadow lies, and the faceplate is that area of the dial where the shadow is cast, and that tells
- ❖ The horizontal dial plate of this sundial consists of hour lines that radiate outward from the very top of the gnomon. The key to using horizontal sundials is that they should be adjusted for various latitudes. Most of these Dials usually have their gnomon usually set at 45 degrees, which obviously suggests that the sundial is designed to be used at a latitude of 45 degrees. the exact, final time.

# Vertical Dial



- ❖ This type of sundial is popularly found hanging on the walls of churches and other similar buildings. The shadow-receiving plane of the vertical sundial is aligned vertically, and the gnomon is positioned in a way that it aligns with the Earth's axis of rotation. A key feature of this type of sundial is that it is not equiangular, which means that the line of shadow does not move in a uniform manner on the dial's face.
- ❖ [Vertical sundials](#) are typically mounted walls on numerous buildings such as church-towers, town halls, and cupolas. The main reason for mounting them on walls is that they can be easily spotted from far away. They may even be placed on all the sides of a regular tower. This way, the dials can allow people to tell the time throughout the day. The gnomon of these sundials is often a single metal bar, but may also be a tripod of metal bars in order to help provide rigidity. Considering the fact that the gnomon's style should always be parallel to the Earth's axis, it is usually pointing toward the true North, and its horizontal angle is the same as the geographical location of the sundial
- ❖ If the vertical sundial faces due south, the gnomon lies at an equal angle to the co-latitude of the wall or the place where the sundial has been mounted.

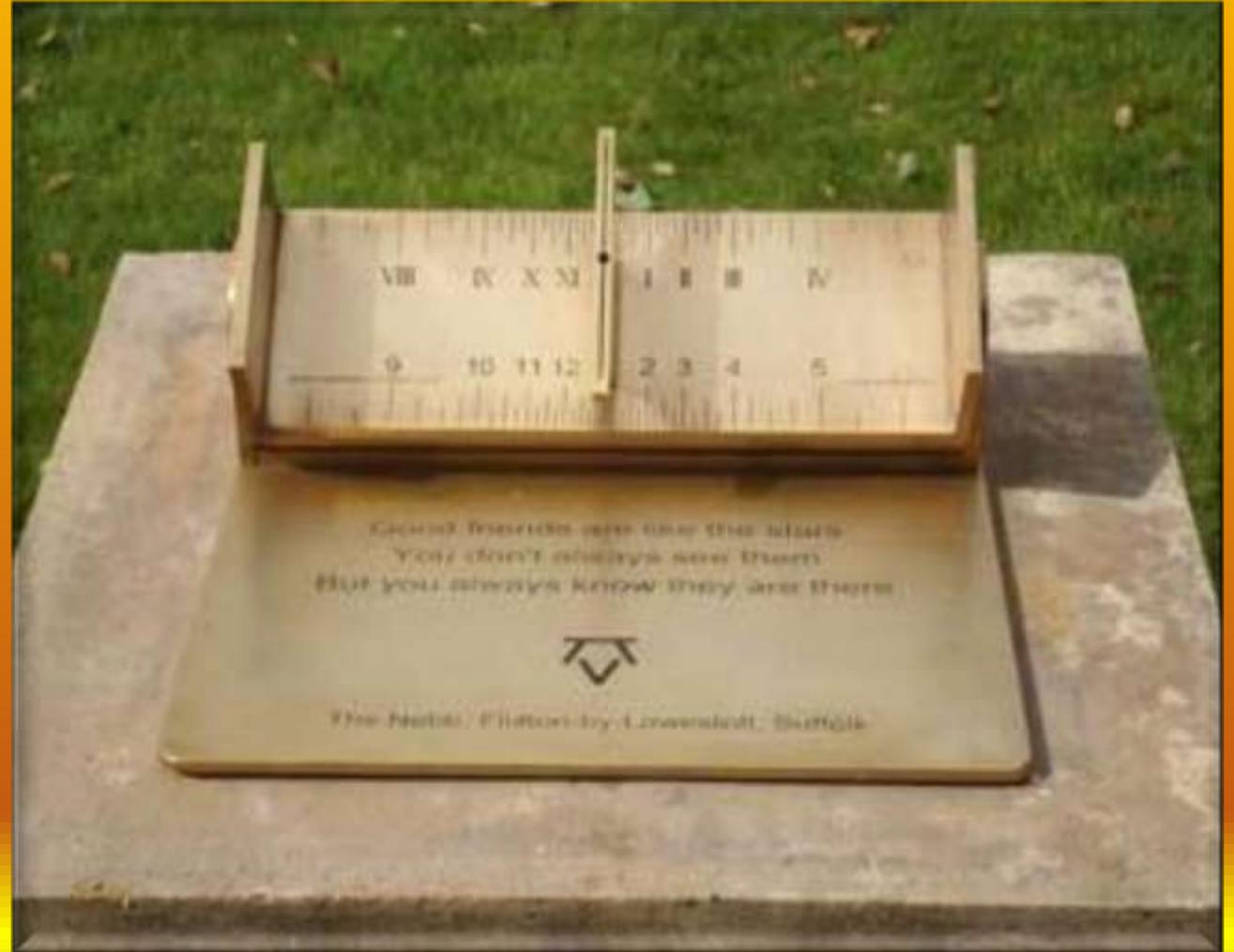
# Polar

In this sundial, the dial plate is set along the East-West direction in an inclining position, which makes it parallel to the polar axis. Its gnomon is also parallel to the dial plate, and so are the hour lines with each other.

This particular positioning of the polar sundial makes its shadow slide sideways on top of the surface as it eventually moves in a perpendicular direction when the sun rotates. When the sun's rays are parallel to the plane of the dial, the parallel hour lines end up spacing far apart, and the shadow moves very quickly.

One of the key requirements of a [polar sundial](#) is that its face should be parallel to the gnomon and it doesn't necessarily have to be vertical.

This sundial has its [table](#) in the polar plane that forms an equal angle to the local altitude while being inclined with the ground. The style of the polar sundial is usually installed on a rod or may even be made of a rectangular plate.



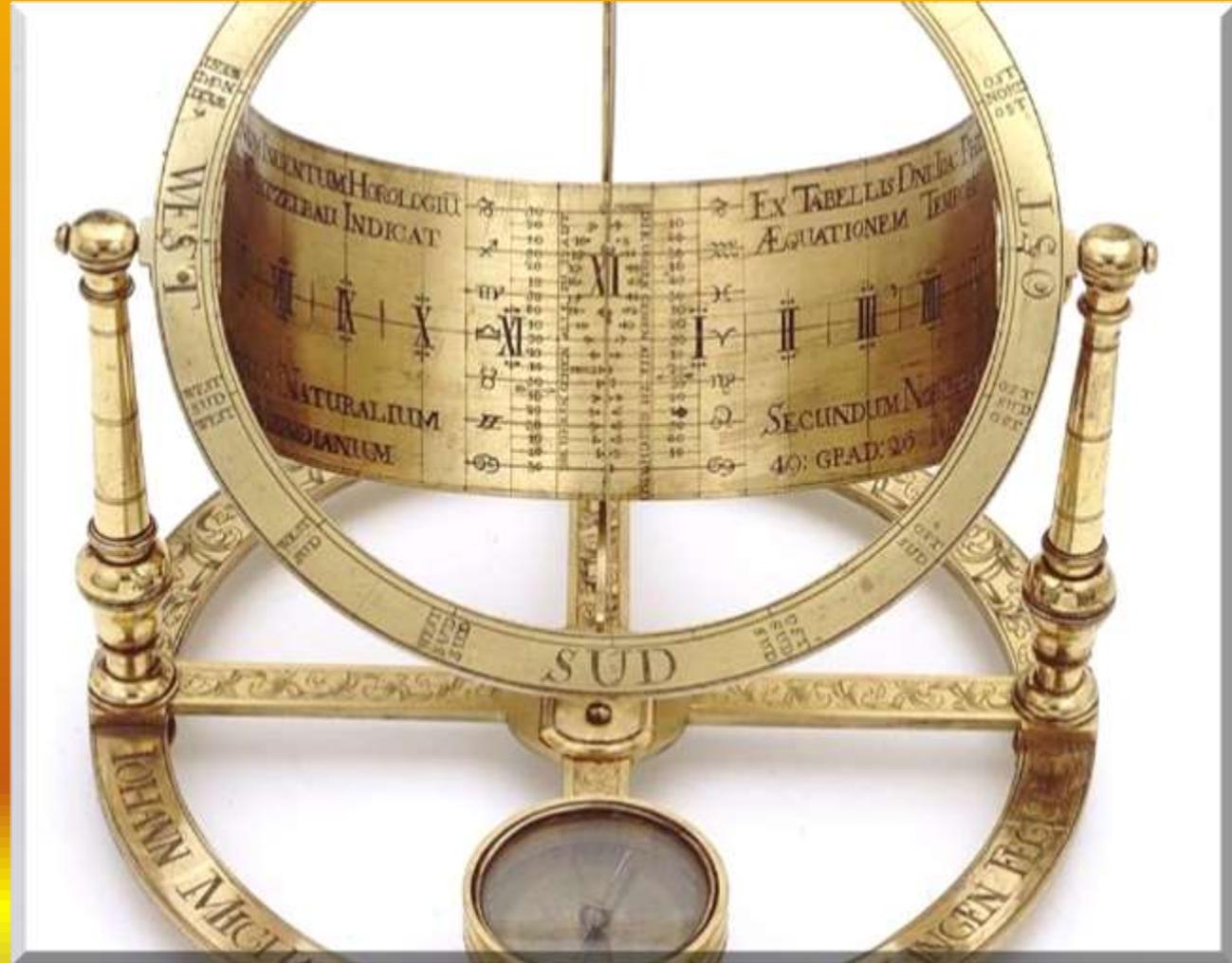
# Equatorial

Also known as the 'equinoctial dial,' the Equatorial sundial has a unique feature which is its 'planar surface' that receives the shadow. The shadow that is cast is exactly perpendicular to the gnomon's style.

The reason why the [Equatorial sundial](#) is called by this name is because it is parallel to the equator of the celestial sphere as well as that of the Earth. It is believed to be one of the easiest sundials to construct and visualize. All it consists of is a flat surface that is aligned with the celestial equator along with a gnomon that is perpendicular to the same celestial equator.

The dial plate of this sundial is often a flat plate or sometimes even a circular ring. The plane of this ring lies perpendicular to the gnomon. Since the gnomon of the equatorial sundial is parallel to the Earth's axial rotation, the dial plate is also parallel to the plane of the equator.

A popular sub-type of this sundial is the equatorial ring sundial, in which the hour markings are contained within a ring or partial ring in place of the solid plate surface. When the sun travels along the equator plane at the equinox, the top half of the equatorial ring casts a shadow which completely covers the sundial markings. This is why this type of sundial is unable to tell the time near the equinox.



# Altitude Sundials

This is the second main sundial group, and as the name suggests, it helps determine the time by using the sun's altitude. The altitude of the sun is basically its height above the horizon. These Dials were often incorporated in folding rules and quadrants.

Altitude dials are not oriented towards the north, but in fact, they are generally held vertically towards the sun. A spot of light the shadow tip of the dial's gnomon is what usually indicates the sun's elevation.

# Analemmatic Sundial



- ❖ This is also called the vertical center dial and is a type of horizontal sundial, but with a vertical gnomon. The hour markers of this sundial are positioned in an elliptical manner. An interesting feature of the [Analemmatic sundial](#) is that its gnomon does not hold a fixed position and is required to change daily in order to determine the time of the day as correctly as possible. This is the main reason why there are no lines on this type of dial and the time can only be read on the ellipse.

The movable gnomon of this sundial is vertical, and its position on the dial actually depends on the date, which is what determines its variable center. The circumference of the dial's ellipse has points on it which indicate the total hours of the time.

There are three main defining features of the Analemmatic sundial, which include the size of the ellipse that is decided by the designer, the declination of the sun, and the latitude of its location. The sun's declination helps determine the daily gnomon position while its location's latitude identifies the position of the hour markers on the ellipse.

The reason why this sundial is ellipse is because it uses a vertical gnomon and its short-axis is aligned to the North-South while the long axis is more toward the East-West.

# Digital Sundial



As the name implies, the Digital sundial is quite an updated and a fairly recent invention. This type of sundial displays time in digits and sometimes even in the form of words and pictures.

The [digital sundial](#) has been described as a '*singular blend of utility and artistry*' since it offers a creative combination of the advancements of modern technology along with the ancient science of sundials. It works in a manner that is similar to the function of a digital clock, as both of them display the time with the help of digits.

This sundial uses two closely spaced parallel masks that display different images. The image projection completely depends on the angular position of the sun. The first mask basically casts a light pattern that is often striped. The light is cast on the second mask, and this simply depends on the height of the sun. On the other hand, the second parallel mask contains narrow stripes of digits that are displayed afterward.

Interestingly, the striped patterns of the first mask light up the same stripes of the second mask. Both of these together greatly match the image that later represents the actual current time.

As fascinating as digital sundials sound, they do come with a few limitations. They don't work at night and can only tell the time in 20-minute intervals. This suggests that it may not tell you the correct time all the time.

# Ring Sundial



Contrary to other types of sundials, the Ring sundial makes use of light to tell time instead of using shadows. It has a ring with hour lines marked towards the inside. These hour lines consist of a tiny hole, through which sunlight falls on the ring. A key factor is that the ring should be turned on in order for the light to fall on the correct dateline.

The earlier types of ring sundials used to be very small, with a diameter of less than 25 mm. This small size made it very difficult for people to read and correctly identify the time displayed on the dial. Soon enough, people realized that they needed bigger models of this sundial and they saw no reason against increasing the size. The ring sundials that came later were as big as 10cm in diameter, which made telling the time really easy.



# Cylindrical Sundial



This sundial is also known by many other names, such as pole sundial, pillar sundial, portable cylinder, and shepherd's dials. It was once also called a traveler's dial primarily because, back in the day, shepherds used to carry it in their pockets.

A [cylindrical sundial](#) is shaped like a cylinder with the gnomon attached or positioned on its movable top. The main body of the cylinder has hour lines printed on it, and these lines are basically in the form of inscribed curves.

The main principle behind the cylindrical sundial is that the sun reaches a different height according to the hours of a given day and the days of a given year. This sundial seeks to measure the sun's height by using the gnomon to cast a shadow. This shade represents the correct hour of the time by corresponding with the given height of the sun.

The dial of the [cylindrical sundial](#) is contained in a diagram that has a lot of divisions. There is a vertical division that indicates the time and a horizontal one that displays days and months of a year.

In order to determine the correct time, the gnomon of the sundial is set over a vertical line of the day. The time is shown exactly where the shadow of the tip of the gnomon falls on any of the hour lines. An important thing to remember is that this cylindrical sundial is able to tell the correct time only at the latitude for which the dials have actually been adjusted and prepared.

# What do you prefer?

## TO SEE A SHADOW

- This tends to be the easiest sundial to make and mark.
- You do not need to do math (finding latitudes and adjusting your sundial to that degree)
- It is best to start your markings as early as possible but most definitely between 9am and 3pm.

## OR NOT TO SEE A SHADOW

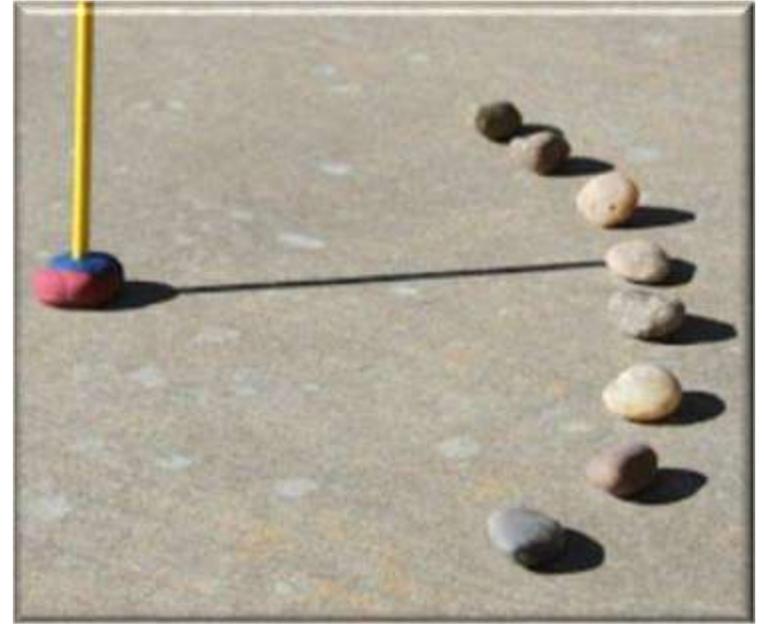
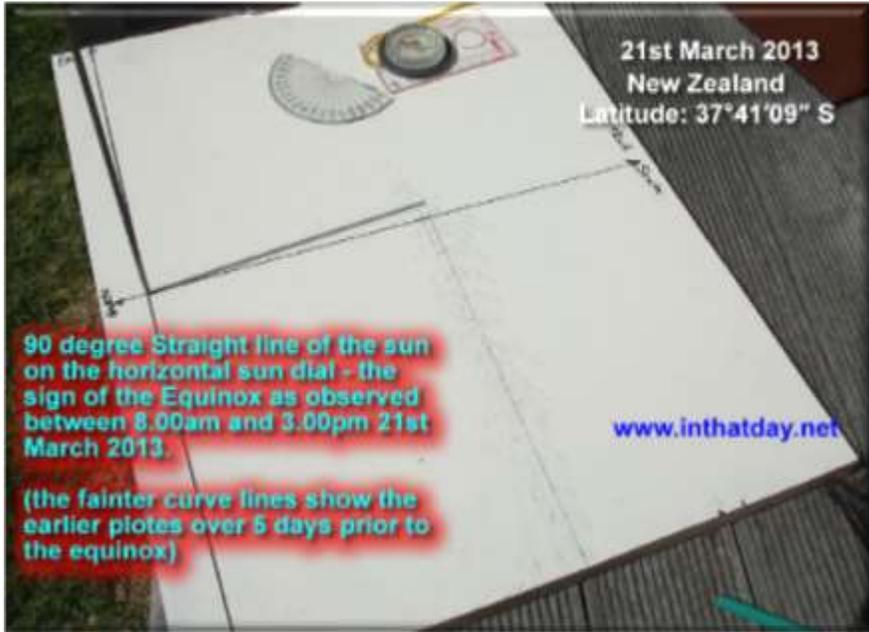
- You must live near the equator
- OR
- If you do not live near the equator, you must find your degrees latitude and make sure your sundial is positioned at the same degree.

# Simple Sundial “How-to”

- The larger the sundial, the easier it becomes to accurately identify the straight-line occurrence of the equinox, as one must look to the outer edges (first sunrise plot and sunset plots) to see a complete straight line has indeed occurred.
- In the southern hemisphere the sun passes in the northern side of the sky. In the northern hemisphere, the sun would be passing in the southern part of the sky, and at the equator the sun would be passing dead overhead.

- The sundial must be accurately aligned at your position to true north, south, east and west. (do not use magnetic north of a magnetic compass).
- To find true north [\(14\) Find True North Without a Compass – YouTube](#)  
You will need two rocks and a stick. Place stick in the ground. Mark the shadow with a rock. 10-15 minutes later use a second rock to mark the second shadow. You have identified east to west. Place each foot in front of each rock and the direction you are facing is true north.

Once you have found truth north you are ready to place your sundial and line its gnomon up with truth north.



Simple as can be

# The Autumn Tequfah

- Cycle 5 of this coming week (Thursday, September 22<sup>nd</sup>, 2022)
- Make your sundial and start watching during the week
- Best time to track the sun is hourly between 9am and 3pm
- Take pictures, document your experience and then share with us on Cycle 6 during Feast of Sukkot (Friday, October 8<sup>th</sup>, 2022) so we can all learn what worked and what didn't and work out the kinks before the Spring Tequfah which marks the turning of the year!
- Have fun!! Be creative!! Be Simple!! Enjoy the journey with Yahuah as you follow His ways and lean to keep His time.

Mat 11:29-30 “Take My yoke upon you and learn from Me, for I am meek and humble in heart, and you shall find rest for your beings. 30 “For My yoke is gentle and My burden is light.”

(Emphasis added)

- Jer 6:16 Thus said יהוה, “Stand in the ways and see, and ask for the old paths, where the good way is, and walk in it; and find rest for yourselves. But they said, ‘We do not walk *in it.*’