

# Daylight Saving Time

Why have it? How is daylight saved?

This lesson applies primarily to DST in the United States.

Daylight Saving Time (DST) is a system for extending daylight hours to save energy.

DST typically shifts one hour of morning daylight to the evening, lessening the need for artificial light before going to bed. One drawback is that more artificial light is needed in the darker mornings, at least until days get longer as spring becomes summer. It remains controversial whether net energy savings occur or are offset by other usage factors.

Sometimes called "Daylight Savings Time," it's about "saving" daylight, so the correct terminology is "Daylight Saving Time."

A concept similar to DST was first suggested by Benjamin Franklin in the late 1700s. Modern DST was first implemented in the early 1900s during World War I. Since then it has been used sporadically by various countries and states. Start/stop dates and time shifts differ by region and not all countries follow it. Some even move the time ahead 2 hours (Double DST).

But even that's a bit misleading, because the daylight that is "saved" in the evening is "lost" in the morning. A more accurate description might be "Daylight Shifting Time."

U.S. states are not required to enact DST, but those that do must change to it on the dates prescribed by federal statute. As of 2007:

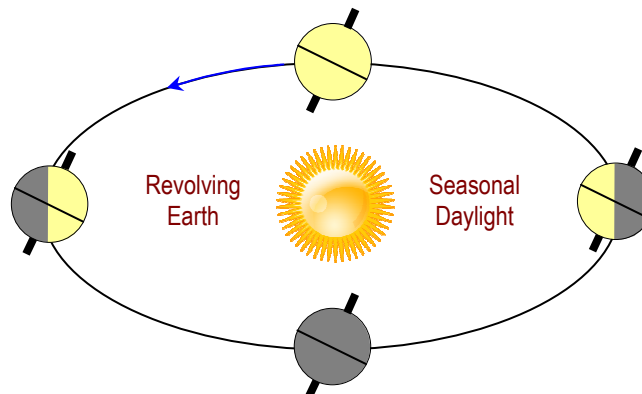
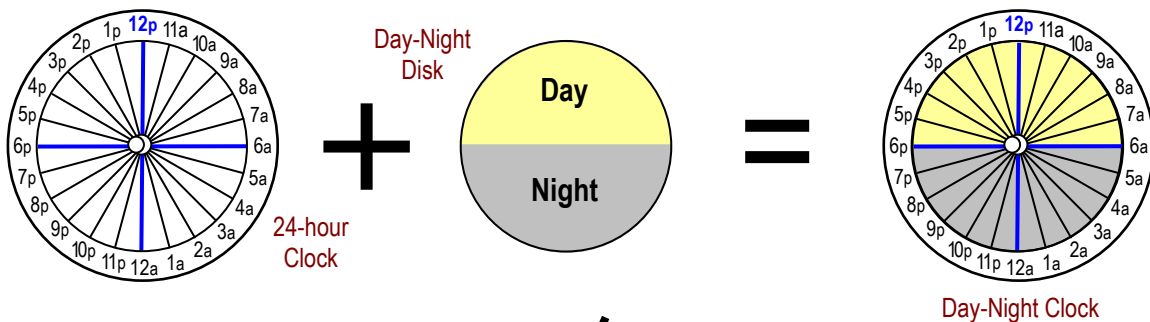
- DST begins at 2 am on the 2<sup>nd</sup> Sunday in March (used to be the 1<sup>st</sup> Sunday in April).
- DST ends at 2 am on the 1<sup>st</sup> Sunday in November (used to be the last Sunday in October).

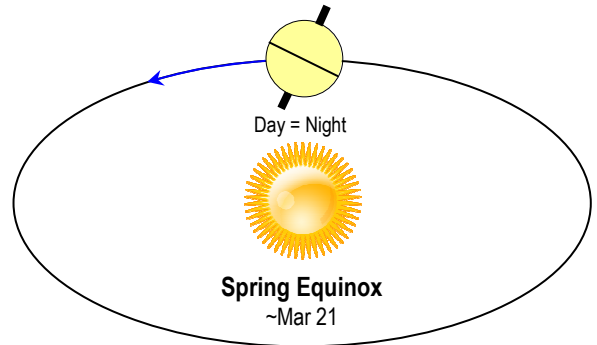
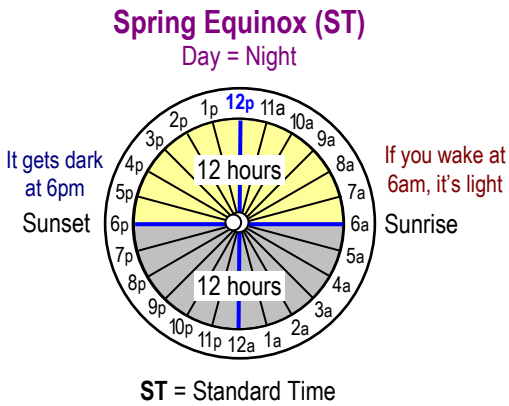
**DST's effects can be confusing because TWO factors are at play:**

- 1. DST alters clock times twice a year (Spring ahead / Fall back).**
- 2. Day/night lengths change with the seasons (Spring, Summer, Fall, Winter).**

Arizona and Hawaii don't switch to DST.

**We'll deal with both factors by superimposing a rotatable 24-hour clock dial onto a day-night disk and tracking seasonal daylight changes with diagrams of a tilted earth revolving around the sun.**



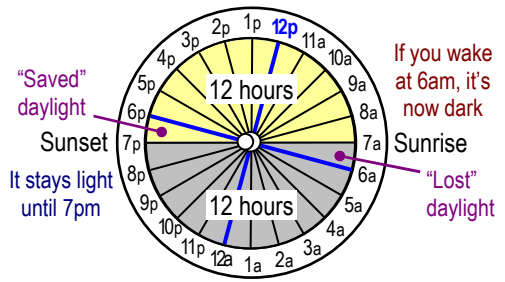
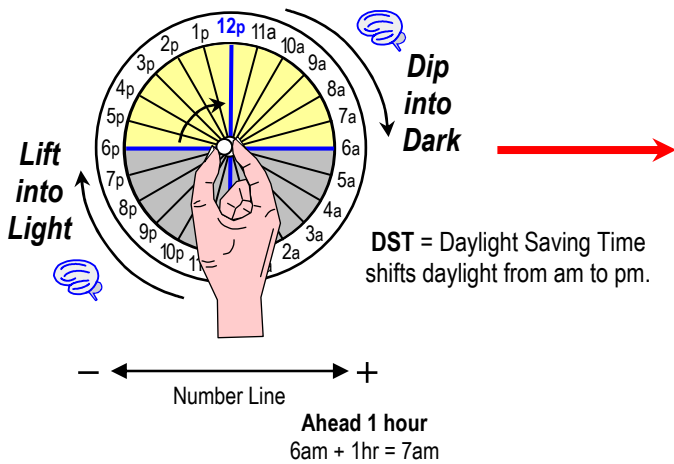


Equinox is Latin for "Equal night," where night is equal to day.

**"Spring Ahead" to DST**  
Rotate clock forward 1 hour

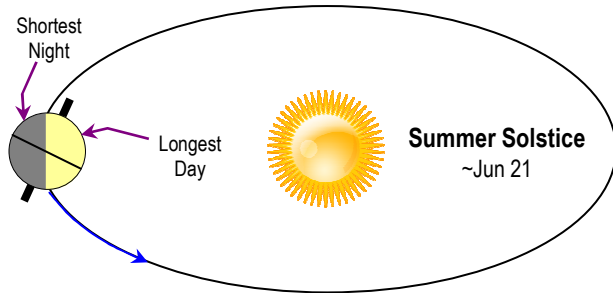
2 am on the 2<sup>nd</sup> Sunday in March  
(About a week before the Equinox)

**Daylight Saving Time**  
Sun rises & sets 1 hour later

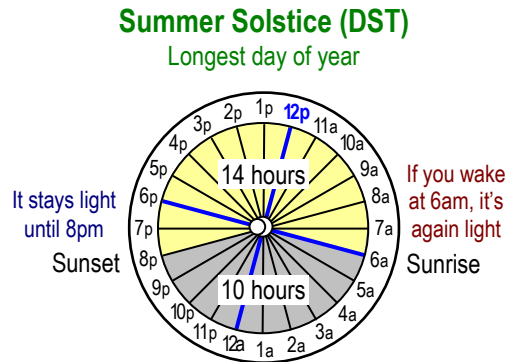


**Paradox**

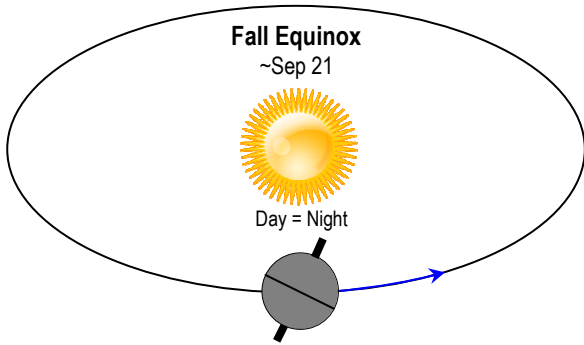
As you rotate the clock "ahead," you lose an hour of sleep. At sunrise, it's now 7 am instead of 6 am.



Solstice is Latin for "Sun stands still," in this case at its *highest* point in the sky for the year.



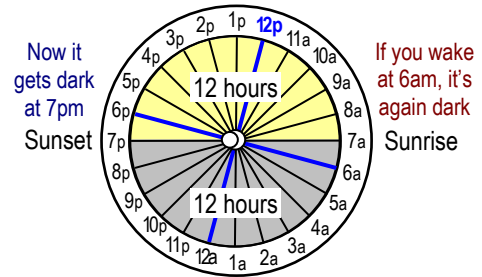
14 hours is an approximate day length. The farther north you live, the longer the day. Examples: Seattle ~16 hrs; Key West ~13.5 hrs



This is the second time of the year where night and day are equal length.

### Fall Equinox (DST)

Day = Night



Days have shortened since Summer and will continue to get shorter as Winter approaches.



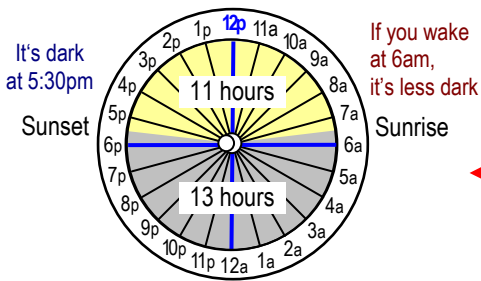
### Standard Time

Sun rises/sets 1 hour earlier

2 am on the 1<sup>st</sup> Sunday in November  
(Several weeks after the Equinox)

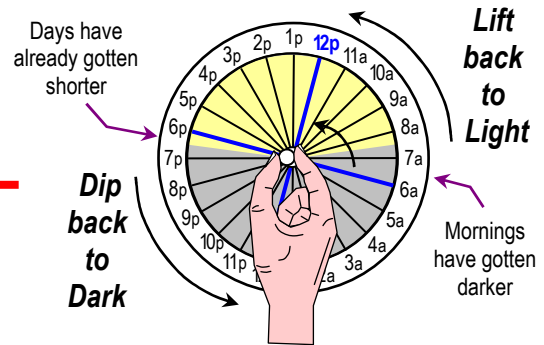
### "Fall Back" to ST

Rotate clock back 1 hour



### Paradox

As you rotate the clock "back," you *gain* an hour of sleep. At sunrise, it's now 6:30 am instead of 7:30.

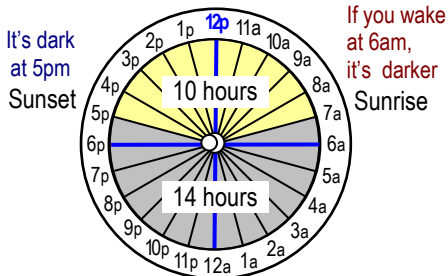


Number Line

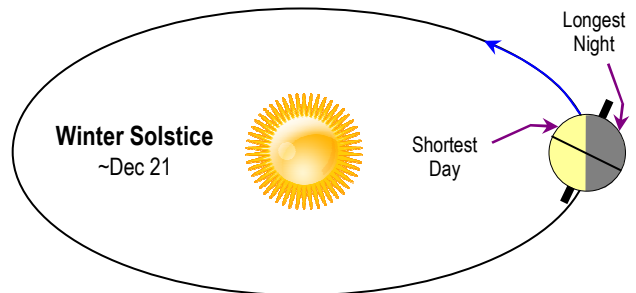
Back 1 hour  
7am - 1hr = 6am

### Winter Solstice (ST)

Shortest day of year



10 hours is an approximate day length.  
The farther north you live, the shorter the day.  
Examples: Seattle ~8.5 hrs; Key West ~10.5 hrs



At this solstice, the "Sun stands still" at its lowest point in the sky for the year.

### Advantages of DST

- Lighter evenings require less artificial lighting after work/school and before going to bed.
- Increased daylight visibility reduces evening traffic accidents.
- More evening daylight is available for outdoor activities and entertainment, so less home energy is used.
- More after-hours athletics increase participants' health.
- Lighter evenings encourage more shopping and tourism, benefiting retail outlets and the economy.

### Disadvantages of DST

- Darker mornings require more artificial lighting (although this lessens as days get longer).
- People lose an hour of sleep in the Spring (although they gain it back in the Fall).
- People returning home from work/school earlier during the summer prompts more air conditioning usage on hot days.
- Pedestrians/bikers are more likely to be struck by vehicles on darker mornings.
- When farmers' workdays start in the dark, more lighting is required, and there is more dew on crops which delays harvesting activities.

### Negative Issues of Changing Time

- Clocks, watches, and devices with internal clocks must be updated twice a year.
- Times kept by planes, trains, computers, and other devices may be out of sync and cause coordination and scheduling problems.
- Sleep, mood, and health may be disrupted as people lose or gain an hour of sleep.
- People may forget to change their clocks and mistakenly arrive early or late for meetings and events.
- When switching back to Standard Time, pedestrian deaths increase until drivers adjust to darker evenings.

### Why Keep DST?

- Most people like the extended daylight hours.
- Many governments are convinced that it saves energy.

### Why Not Have DST Year Round?

As winter approaches, ever-shortening days lead to mornings that are too dark for students and workers. Switching back to Standard Time "lifts the mornings into light" (although it gets dark even earlier in the evenings).

## Your Turn!



*Match the word number with the example letter that best fits.*

- |                             |                           |
|-----------------------------|---------------------------|
| 1) ___ Equinox              | a. Longest day of year    |
| 2) ___ Winter Solstice      | b. Longest night of year  |
| 3) ___ Summer Solstice      | c. Equal day and night    |
| 4) ___ Standard Time        | d. Makes evenings lighter |
| 5) ___ Daylight Saving Time | e. Makes mornings lighter |

*True or False*

- 6) \_\_\_\_\_ Daylight Saving Time is mandatory in the U.S.
- 7) \_\_\_\_\_ Whether or not DST saves energy is controversial.
- 8) \_\_\_\_\_ The switch back to Standard Time reduces evening pedestrian deaths.
- 9) \_\_\_\_\_ DST doesn't change day lengths, just the hours of sunrise and sunset.
- 10) \_\_\_\_\_ DST shifts daylight from morning to evening.

### Links

For a comprehensive review of DST, including its history and some fascinating anecdotes, visit:  
[www.webexhibits.org/daylightsaving](http://www.webexhibits.org/daylightsaving)

For various time and date calendars, including day/night lengths and sunrise/sunset times in different geographic locations, visit:  
[www.timeanddate.com](http://www.timeanddate.com)

Answers: 1c, 2b, 3a, 4e, 5d, 6F, 7T, 8F, 9T, 10T