# Daylight Saving Time

Why have it? How is daylight "saved"?

This lesson applies primarily to DST in the United States.

### History

A concept similar to DST was 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. Some countries don't follow DST at all. Some countries shift the time 2 hours (Double DST).

### Purpose

Daylight Saving Time (DST) is a system for extending daylight hours for the purpose of saving 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.

### Saving or Savings?

Although many people refer to it as "Daylight Savings Time," it's about "saving" daylight, so the correct terminology is "Daylight *Saving* Time."

But even that's a bit misleading, because the daylight that is supposedly "saved" in the evening is actually "lost" in the morning. So 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.

**March**

| S | M | T | W | T | F | S |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | DST begins at 2 am on the 2nd Sunday in March. | | | | |

Formerly 1st Sunday in April

As of 2007

**November**

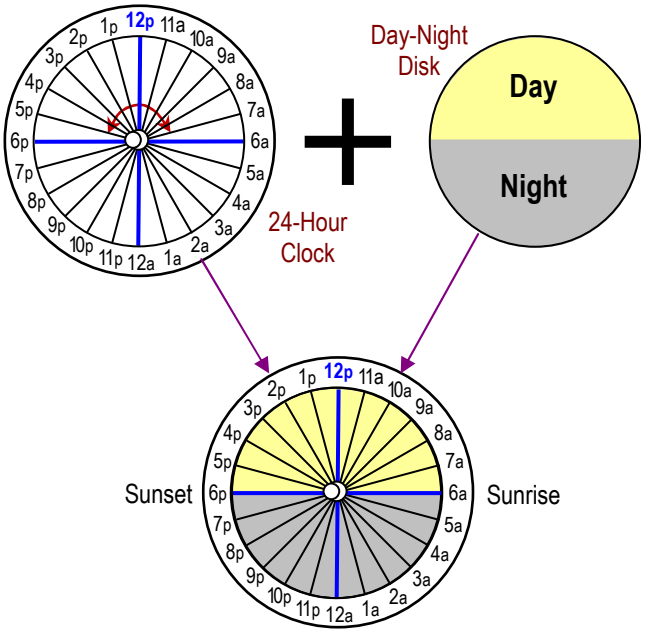
| S | M | T | W | T | F | S |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | DST ends at 2 am on the 1st Sunday in November. | | | | |

Formerly last Sunday in October

Arizona and Hawaii don't switch to DST.

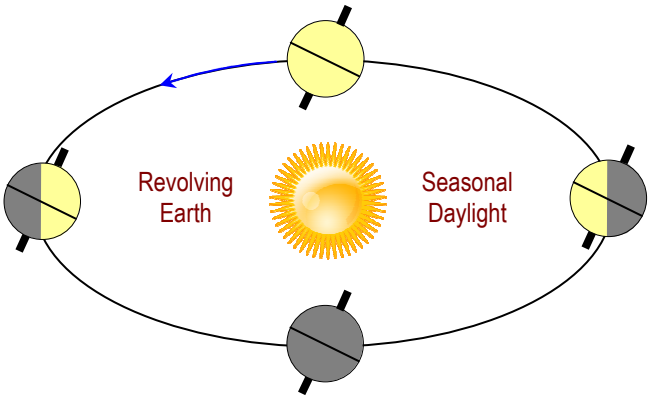
**DST's effects can be confusing because TWO factors are at play:**

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

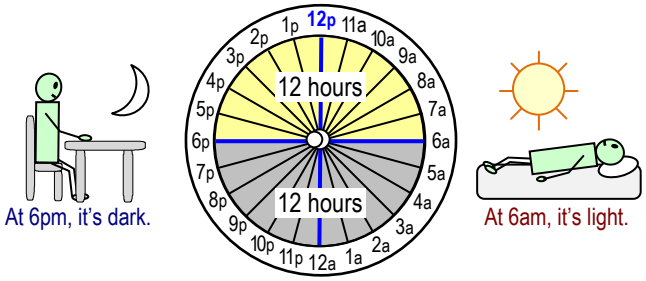


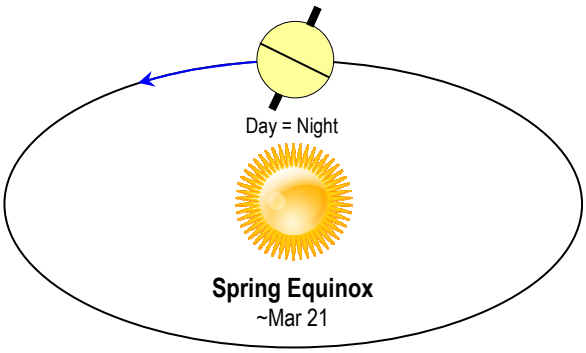

We'll deal with both factors using:

- A 24-Hour Clock + a Day-Night Disk.
- Diagrams of the Earth orbiting the Sun.



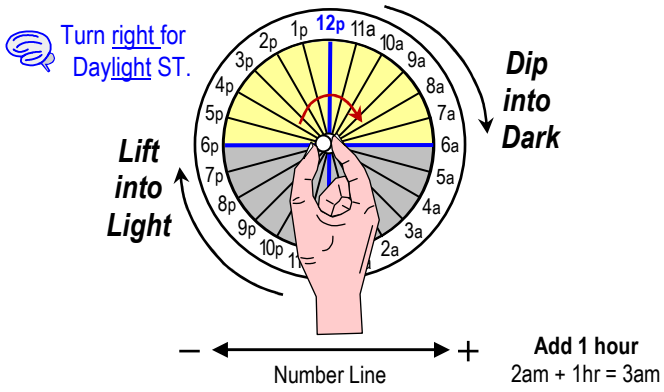
**Spring Equinox**
Day = Night



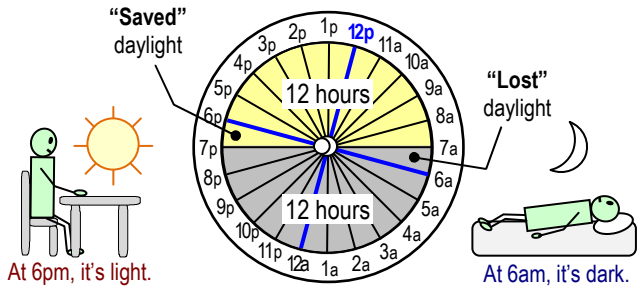

Equinox is Latin for "Equal night," where night hours equal day hours.

**"Spring Forward"**
Rotate clock forward 1 hour




Currently the switch to DST occurs about a week *before* the Spring Equinox. In the past it's occurred a week or so *after*.

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



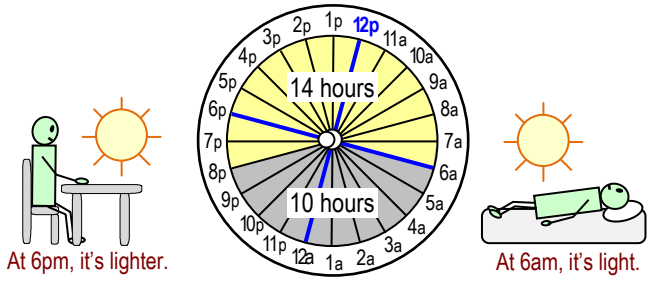

**Paradox**
After you rotate the clock *forward*, you *lose* an hour.

(You didn't get to live those 60 minutes.)

From here, days will start getting longer.

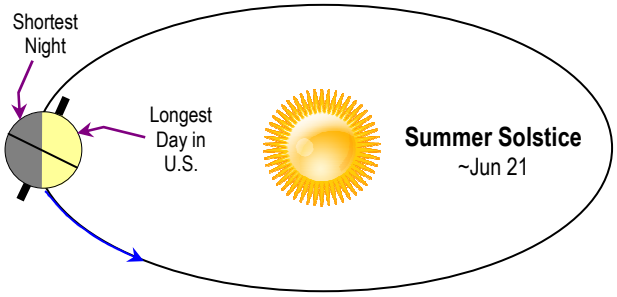
## Summer Solstice

Longest day of year




14 hours is approximate.
Farther north = Longer day:

- Seattle ~16 hr day
- Key West ~13½ hr day




Solstice is Latin for "Sun stands still."
The Sun has climbed to its *highest* point in the sky for the year.
The next day it will reverse course and be lower in the sky.

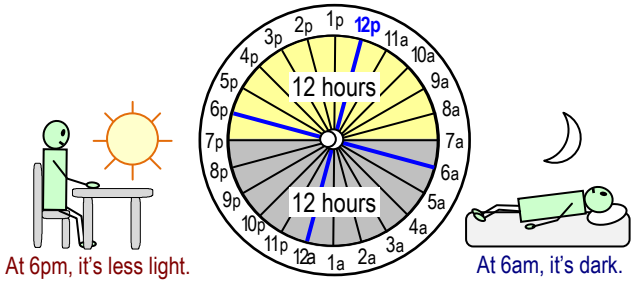
From here, days start getting shorter.

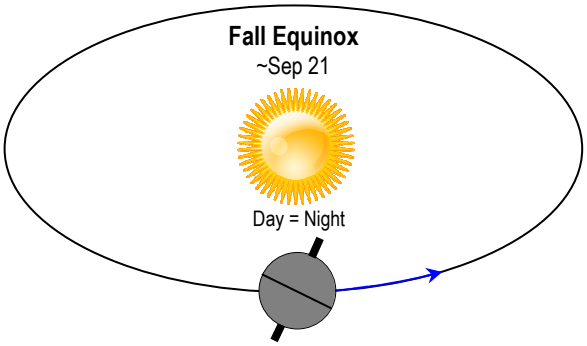
SOLSTICE = Winter/Summer
Severe temperatures

EQUINOX = Spring/Fall
Equal temperatures

## Fall Equinox

Day = Night



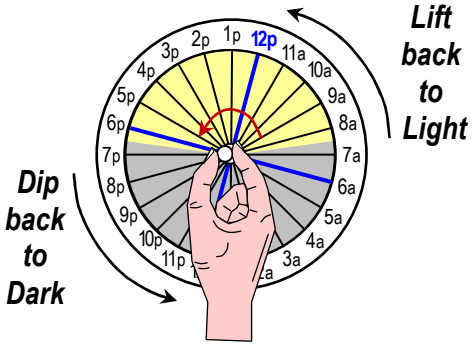




After this, days are shorter than nights.

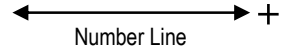
This is the second time of the year where night and day are equal length.

## "Fall Back"

Rotate clock back 1 hour



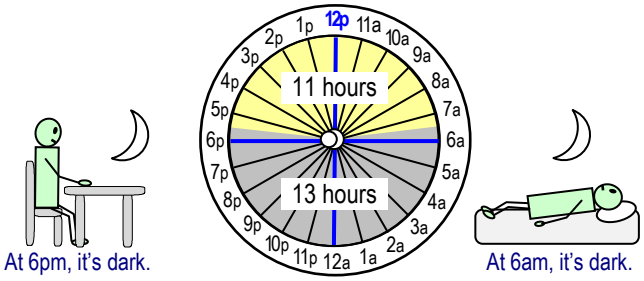

**Subtract 1 hour**
2am – 1hr = 1am




The switch back to Standard Time occurs several weeks *after* the Fall Equinox, so the days have already gotten shorter.

## Standard Time

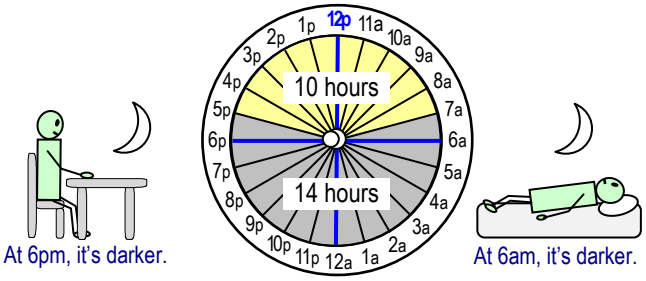
Sun rises & sets 1 hour earlier




Days keep getting shorter.

## Winter Solstice

Shortest day of year




10 hours is approximate.
Farther north = Shorter day:

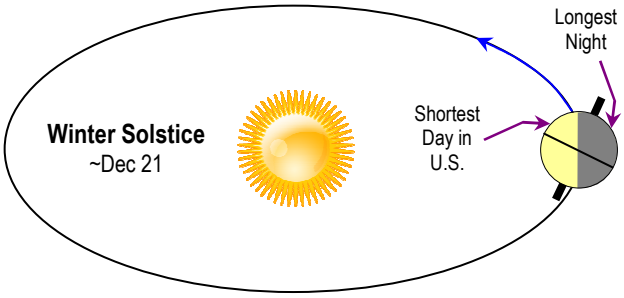
- Seattle ~8½ hr day
- Key West ~10½ hr day

From here, days will get longer until they equal nights at the Spring Equinox, and the DST cycle repeats.

## Paradox

After you rotate the clock *back*, you *gain* an hour.

(You get to live those 60 minutes again.)




The "Sun stands still" having sunk to its *lowest* point in the sky for the year. The next day it will reverse course and be higher in the sky.

### Advantages of DST

- Lighter evenings:
  - lessen the need for artificial lighting before bedtime.
  - increase visibility which reduces evening traffic accidents.
  - keep people out of doors so they use less home energy.
  - allow outdoor athletics which increase participants' health.
  - encourage shopping and tourism, benefiting economies.

### Disadvantages of DST

- Darker mornings:
  - require more artificial lighting upon awakening.
  - reduce visibility which increases morning traffic accidents.
  - require more early morning work/farm lighting.
  - lead to more dew on farm crops which delays harvesting.
- People returning home from work/school earlier during the summer prompts more home air conditioning on hot days.

### Why Keep DST?

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

### Time Change Impacts

- 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 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 at night).

# 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

## Links

For a comprehensive review of DST, including its history and some fascinating anecdotes, visit: 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

*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.

11) _____ When Standard Time returns, you get an extra hour of sleep.

12) _____ Equinoxes occur each Winter and Summer.

13) _____ Summer days are longer in northern regions.

14) _____ DST steals an hour of time each Spring.

15) _____ When DST occurs, morning times are darker.

Answers: 1c, 2b, 3a, 4e, 5d, 6F, 7T, 8F, 9T, 10T, 11T, 12F, 13T, 14T, 15T