



ASTRONOMY, THE CHURCH, & TIMEKEEPING

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QUESTIONS

From where do we get the

Day
Month
Year
Week?

THE DAY – EARTH'S ROTATION



Solar Day

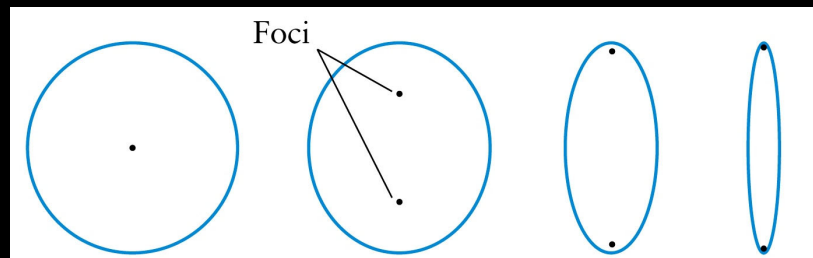
If there was only Rotation of the Earth, then the day would be

$$= 24^{\text{h}} 00^{\text{m}} 00^{\text{s}}$$

Think about it – This would be the time from one crossing of the Meridian to the next crossing by the Sun.

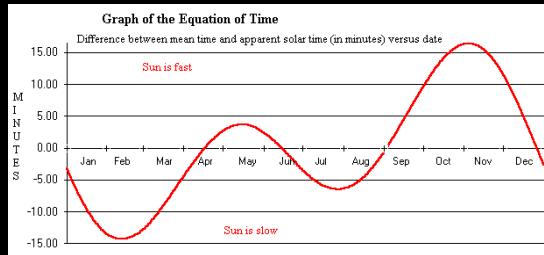
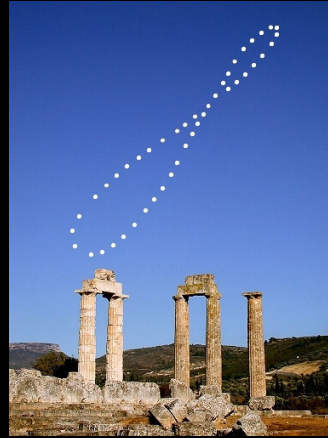
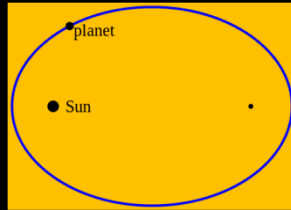
(am & pm)

ORBIT OF THE EARTH



The Earth's orbit is almost exactly circular, but it deviates a little. Because of the slight deviations, the time it takes the Sun to travel from one meridian crossing to the next varies (regularly).

THE DAY – IRREGULARITIES



THE DAY – LONGITUDE EFFECT



THE DAY – ALL EFFECTS



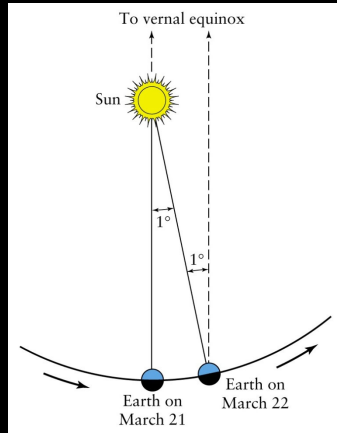
THE MEAN SOLAR DAY

Mean Solar Day
= 24^h 00^m 00^s

Think about it – Does a clock really tell accurate time?

Is the day really based on the Sun?

THE SIDEREAL DAY



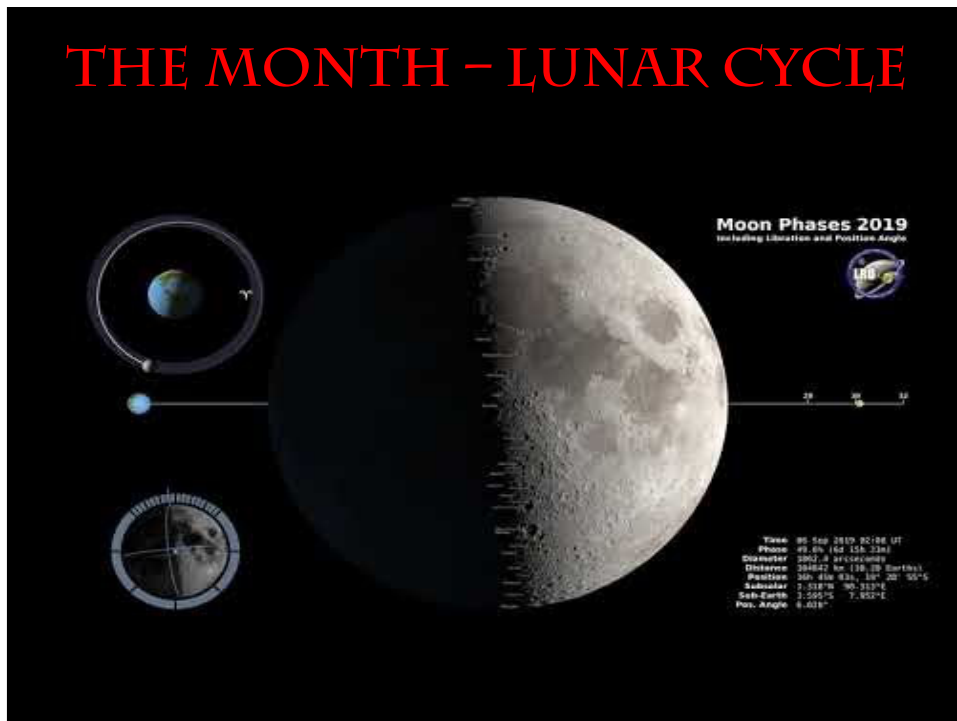
Sidereal Day

The Earth is also Revolving while it is Rotating, so with respect to the *background stars*, one day

$$= 23^{\text{h}} 56^{\text{m}} 04^{\text{s}}$$

Think about it – There are 360° in a circle and there are 365.25 days in a year. Are these related?

THE MONTH – LUNAR CYCLE



THE YEAR – EASTER



Dionysius Exiguus, a monk from Russia, was asked by Pope John I to calculate the Easter dates from the years AD 527 to 626.

Dionysius decided to start with what he considered to be the year of Jesus' birth. He began with the year in which Rome had been founded.

From the evidence available to him, he computed that Jesus was born 753 years after the founding. [750 + 3]

THE YEAR – JULIAN CALENDAR



Julian Calendar

46 BC

1 year = 365.2500 days

THE YEAR – MONTH NAMES

Month	Latin	English
September	Septem	Seven
October	Octo	Eight
November	Novem	Nine
December	Decem	Ten

THE YEAR – GREGORIAN FIX



Julian Calendar

46 BC

1 year = 365.2500 days



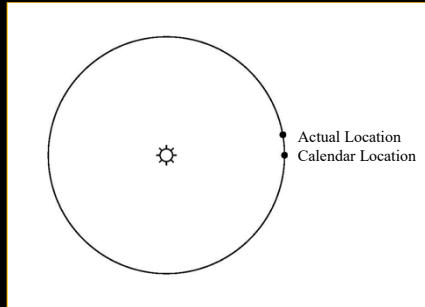
Gregorian Calendar

AD 1582

1 year = 365.2422 days

(= 11^m 14^s)

THE YEAR – ADJUSTMENT 1



Easter's Date had shifted.

Removed 10 days:
Oct 4 → Oct 15, 1582

THE YEAR – CONVERSIONS

Catholic Countries 1582
10 days

British Empire 1752
11 days

Russia 1918 13
days

Orthodox 1923
13 days



It's Y2K, thanks to lag in calendar

On a schedule that's nearly seven years behind the rest of the world, Ethiopian immigrants celebrate turn of the millennium.

BY MARY LOU PICKEL
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There was dancing all night in Addis Ababa, but in Atlanta the celebration will be a little more subdued.

It's the second Millennial New Year's Eve for many of Atlanta's Ethiopian immigrants.

Still, stores along Buford Highway, Atlanta's immigrant avenue, are selling Year 2000 bumper stickers, key chains and T-shirts for this week's Ethiopian millennium event.

Ethiopia is nearly seven years behind the rest of the world, following its unique national calendar derived from the Julian calendar instituted by Roman Emperor Julius Caesar in 45 B.C.

Most of Europe switched to the Gregorian calendar in 1582 when Pope Gregory XIII told them to and that's the calendar we follow today.

"We have our own calendar," said Lesanu Alemu, 29. "Ours is ours."



Elsa Asrat, 46, originally of Ethiopia, makes injera, the national bread of Ethiopia. She'll sell the bread today at the Ethiopian Millennium Celebration in Clarkston. Ethiopia follows a national calendar derived from the Julian calendar instituted by Roman Emperor Julius Caesar in 45 B.C.

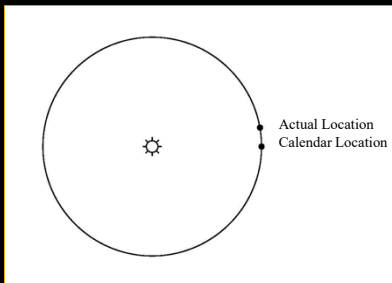
MARY LOU PICKEL / Staff

Those who were here seven years ago remember the Y2K celebration, the fireworks and the worry over computer problems, but it all seemed foreign.

Alemu spent \$45 to call his parents back home and hear about the huge celebration in the capital city of Addis Ababa and his sisters dancing the

old son with presents in order to keep up with the other first-graders at McClendon Elementary School.
The Ethiopian Christmas in

THE YEAR - ADJUSTMENT 2



If the year is evenly divisible by 4,
Yes, unless

If the year is evenly divisible by 100,
No, unless

If the year is evenly divisible by 400,
Yes

EASTER – CATHOLIC



First Sunday

After the

First Full Moon
(defined to be the 14th day)

After the

Spring Equinox
(defined to be March 21)

EASTER – ORTHODOX



First Sunday

After the

First Full Moon
(defined to be the 14th day)

After the

Spring Equinox
(defined to be April 3
using the Julian Calendar,
a difference of 13 days)



THE WEEK – WHY SEVEN DAYS?



THE WEEK – DAY NAMES

ENGLISH			SPANISH	
Day	Deity	Object	Day	Object
Sunday	Sun	Sun	Domingo	Sol
Monday	Moon	Moon	Lunes	Luna
Tuesday	Tiu (Tyr)	Mars	Martes	Marte
Wednesday	Woden	Mercury	Miercoles	Mercurio
Thursday	Thor	Jupiter	Jueves	Jupiter
Friday	Frigga	Venus	Viernes	Venus
Saturday	Saturn	Saturn	Sabado	Saturno

THE YEAR – WEEK CONSTANT

September 1752						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
		1	2	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

Phases of the moon: 15: ☾ 23: ○ 30: ☾