

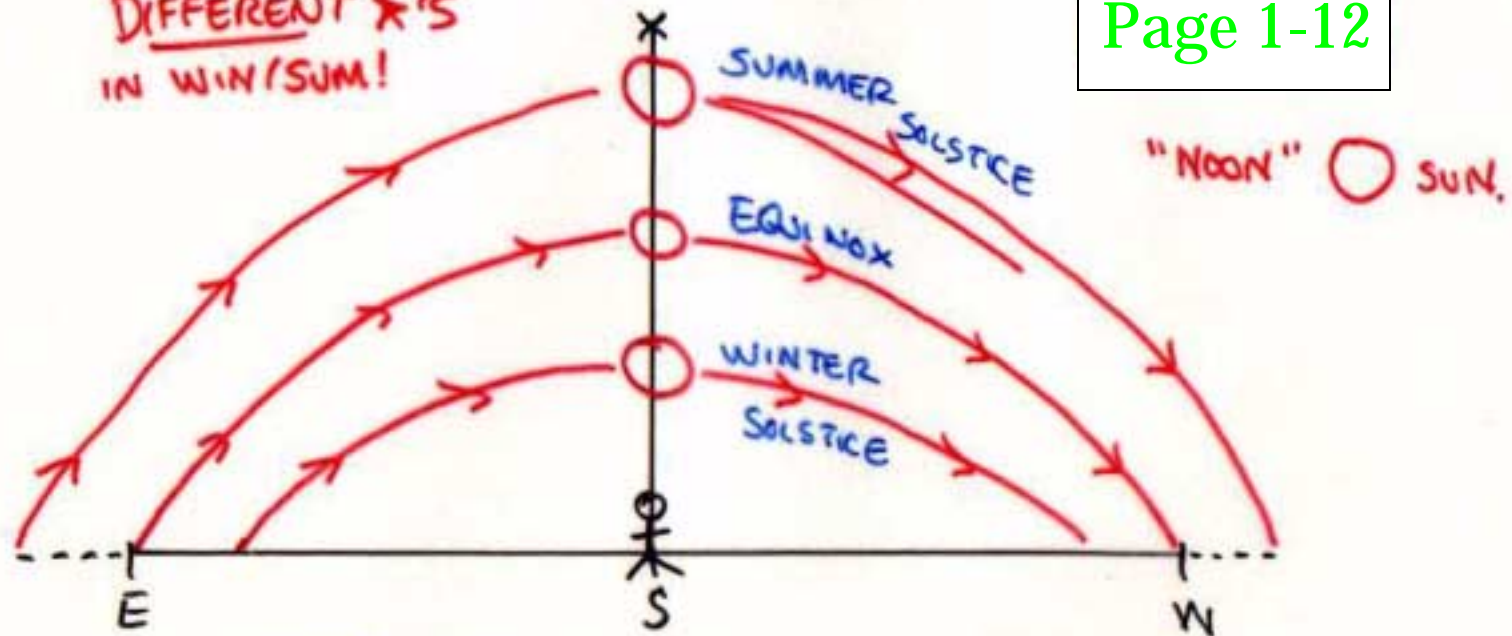
## ● REASON FOR THE SEASONS

- PHENOMENA TO EXPLAIN!
- TILT OF THE EARTH'S AXIS
  
- VIEWPOINT IN THE SOLAR SYSTEM.
  - EQUINOXES
  - SOLSTICES

# ☐ PHENOMENA TO EXPLAIN "FEATURES OF THE SEASONS"

- HOT IN SUMMER, COOL IN WINTER (FOR US!)
- "BACKWARDS" IN THE SOUTHERN HEMISPHERE!  
HOT IN WINTER, COOL IN SUMMER (FOR AUSTRALIA!)
- SUN CHANGES POSITION IN THE YEAR (AGAINST THE \*'S)  
DIFFERENT \*'S  
IN WIN/SUM!

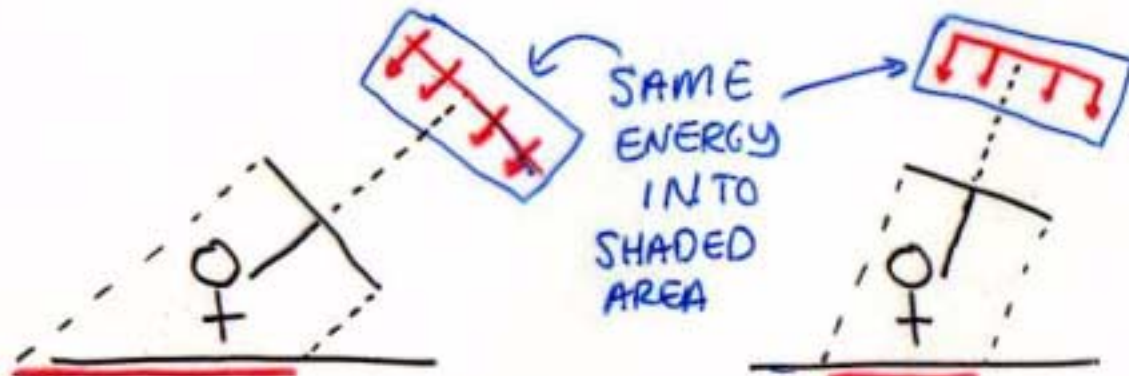
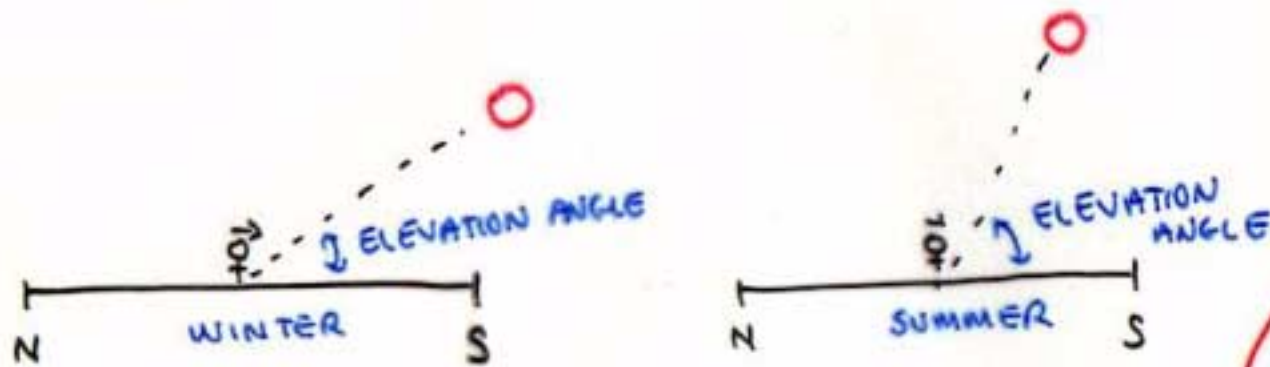
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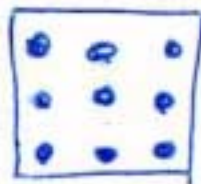
WHY SHOULD ANY OF THIS BE SO?

□ "HEIGHT" (ELEVATION) OF THE NOON-TIME SUN  
 MAKES WINTER COLD AND SUMMER HOT.

4 D.  
 4-6 to 4-9  
 PAGES  
 IN CH. 4



SHADED AREA  
 BIG AREA



LOW  
 "HEAT"  
 AREA

SHADED AREA  
 SMALL AREA

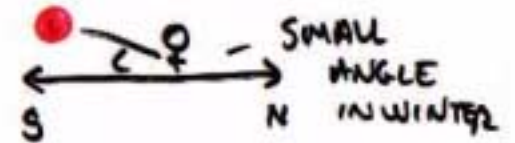
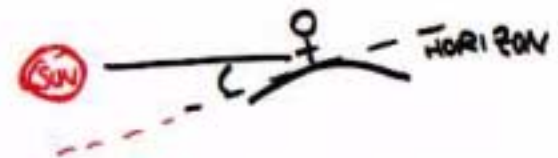
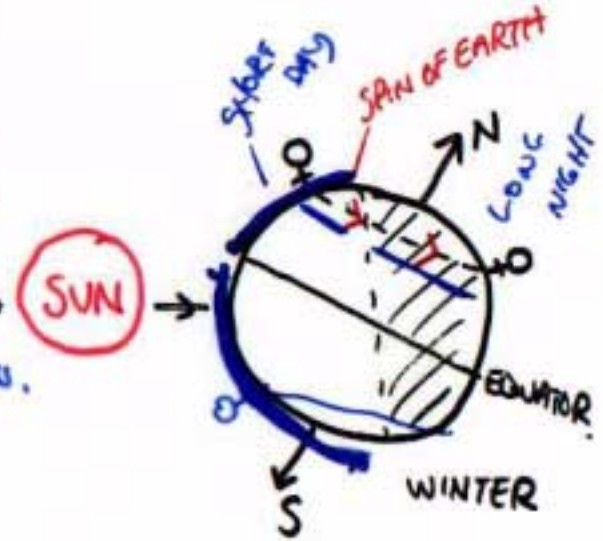
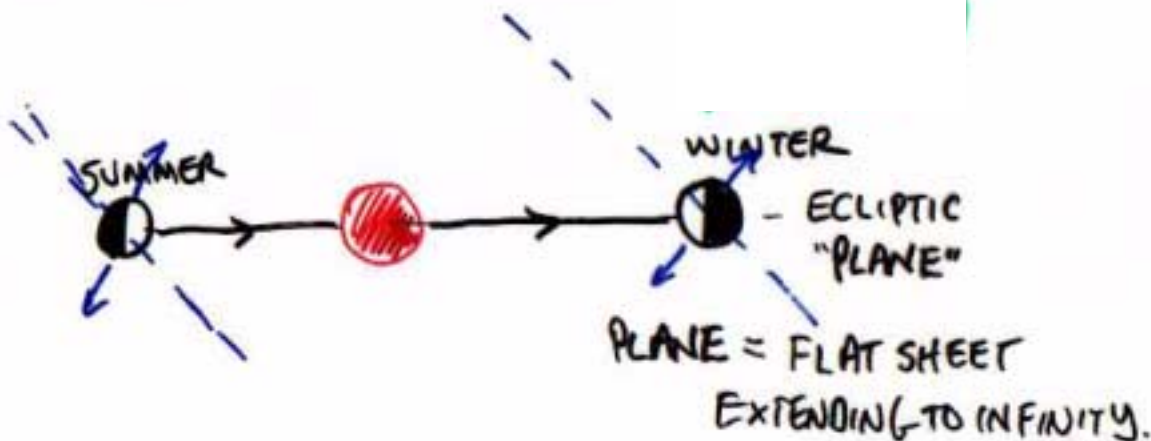
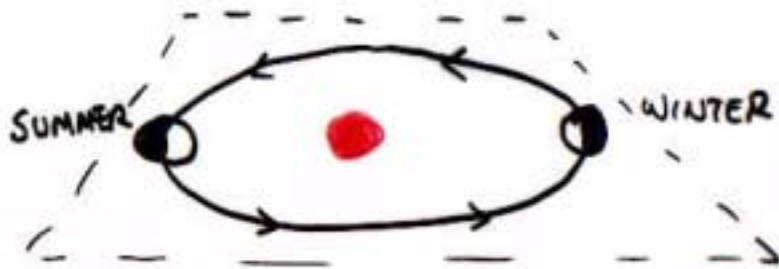
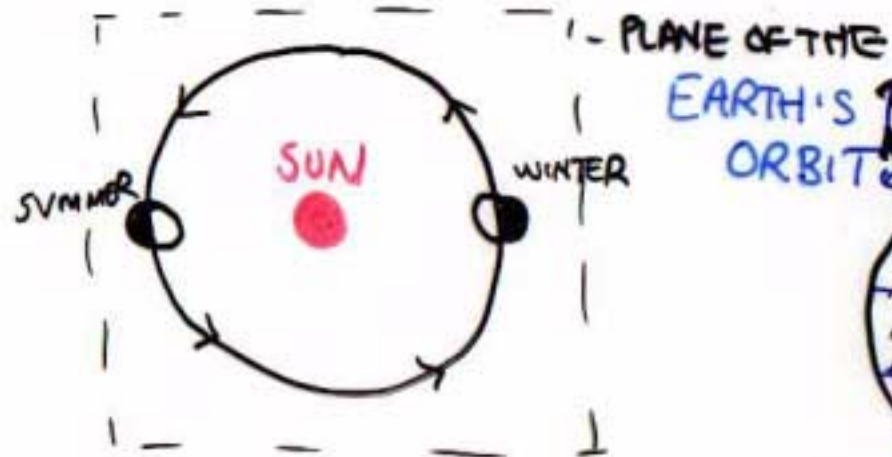


BIG  
 "HEAT"  
 AREA



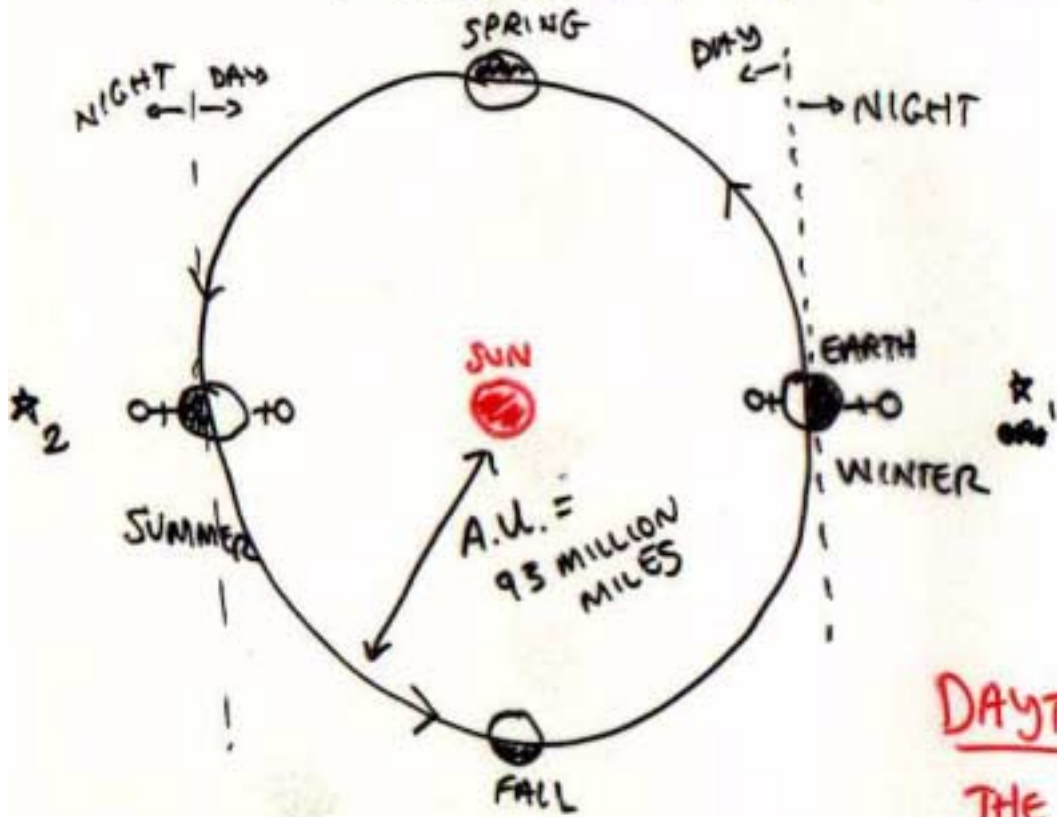
SO...  
 WHAT CONTROLS  
 ELEVATION  
 OF THE  
 SUN?

# □ TILT OF THE EARTH'S AXIS



WHAT DOES "SUMMER" LOOK LIKE?  
DIRECTION OF TILT?

□ TILT OF THE EARTH'S AXIS  
+ THE ORBIT OF THE EARTH



CYCLE TAKES 365 DAYS -  
EARTH-YEAR.

YOU CAN SEE ★₁  
IN WINTER BUT NOT  
SUMMER

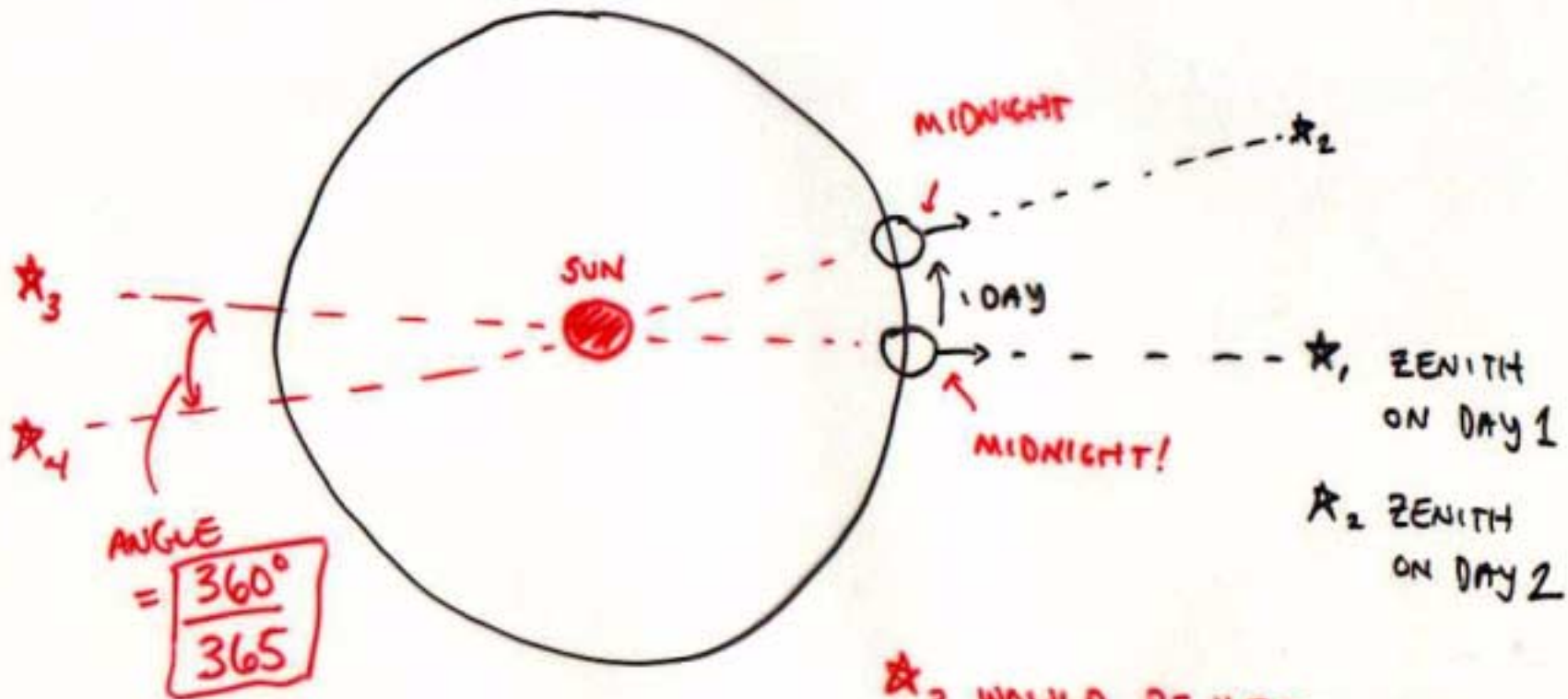
YOU CAN SEE ★₂  
IN SUMMER BUT  
NOT WINTER.

DAYTIME ONLY COMES FROM  
THE DIRECTION FROM EARTH TO  
THE SUN.

SUMMER ★'S ≠  
WINTER ★'S!

# DIFFERENT STARS IN SUMMER + WINTER.

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4-15



$\star_3$  WOULD BE "BEHIND" SUN  
IF YOU COULD SEE IT!  
ON DAY 1

$\star_4$  "BEHIND" SUN ON DAY 2

LOOKS LIKE SUN "MOVED" FROM  $\star_3$  TO  $\star_4$

## □ ORBITING + TILTED EARTH

EXPLAINS SEASONS ✓ NORTH +  
SOUTH HEMISPHERES.

EXPLAINS MOTION OF THE SUN  
ON THE ECLIPTIC

CONVENIENT ... NOT SO SIMPLE OR  
OBVIOUS ... TOOK 2,000 YEARS  
TO FORMULATE

NEWTON GAVE A REASON WHY IT  
SHOULD BE SO...

LAWS ON EARTH ARE SAME  
AS IN THE SKY.