

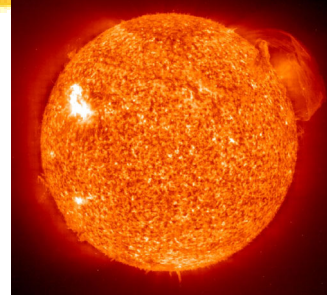
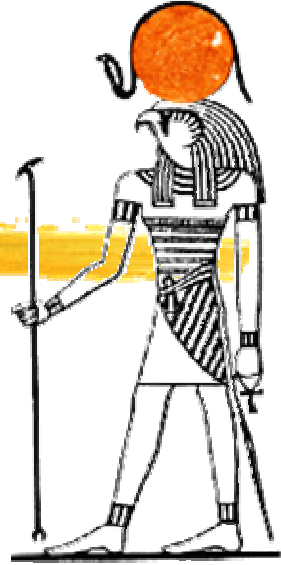
Week 2



Ra (The Solar Cycle)

- Position, size and movement**
- Solar Eclipse**
- Sun's Importance**
- Role in Creation**
- Ra's Journey**
- Solstice and equinox**
- Solar calendar (time)**

Position, Size and Movement



❑ Position

- ❑ Center of our solar system

❑ Size & Structure

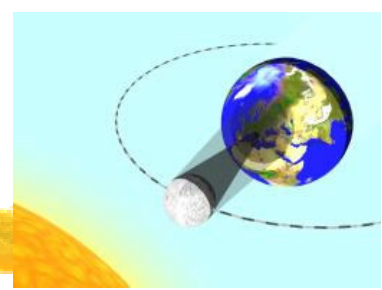
- ❑ Comprises 99.8% of the mass in our solar system
- ❑ Medium size star, but its size is *not* static; composed of hydrogen (74%), helium (7%) and other gases
- ❑ Sun is not solid, but exists in a plasmatic state
- ❑ Sun's generated light/heat is so intense it will cause blindness if viewed directly

❑ Movement

- ❑ Completes a full rotation every 25 days (35 days at its poles)

❑ Other

- ❑ Sun's rays take approximately 8 minutes, and 19 seconds to arrive



☐ The Basics

- ☐ A solar eclipse occurs when the moon passes between the sun and Earth, completely or partially blocking the Sun's ray
 - Total occurs when the moon's shadow falls on the Earth's surface
- ☐ Next solar eclipse visible from Oakland is in 2012

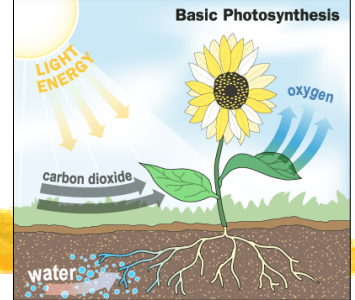
☐ Total Eclipse

- ☐ Occurs roughly every 18 months *somewhere* on Earth
- ☐ Generally occurs about every 370 years in any particularly place
- ☐ If you don't already feel small
 - ☐ The Moon is constantly moving further from the Earth (1.5 inches/year)
 - ☐ In about 600 million years the Moon will be too far away to cause a total eclipse, and the Sun will also begin to enlarge



Week 2: Ra (The Solar Cycle)

The Sun's Importance



☐ Benefits

- ☐ Generates heat through nuclear fusion, converting hydrogen to helium
 - Brighter than 85% of the galaxy's stars
- ☐ Supports all life on Earth, through photosynthesis and drives the Earth's climate and weather

☐ Cave Experiment in 1989

- ☐ Woman lived in a cave for 130 days to test the impact of extended space travel
- ☐ During the period she stayed awake about 20-25 hours at a time, and slept for 10; her menstrual cycle stopped, and she thought she had been gone only 2 months (not 4 months)
- ☐ Researchers believe her muscle tone and bone calcium lowered
- ☐ <http://query.nytimes.com/gst/fullpage.html?res=950DE4D91F3CF937A15756C0A96F948260>

☐ Pineal Gland

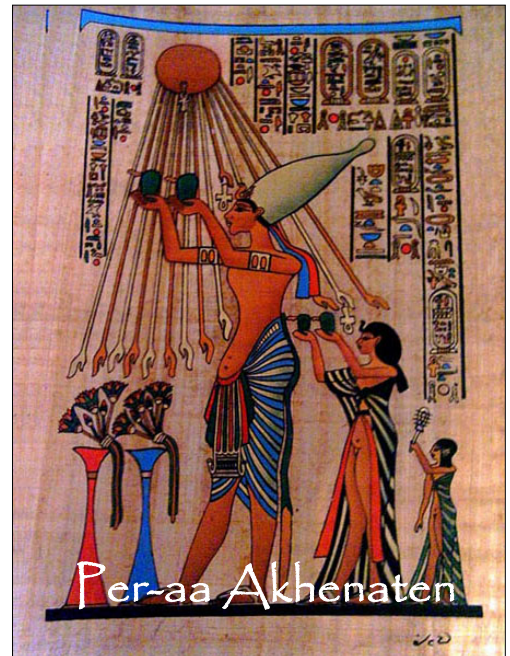
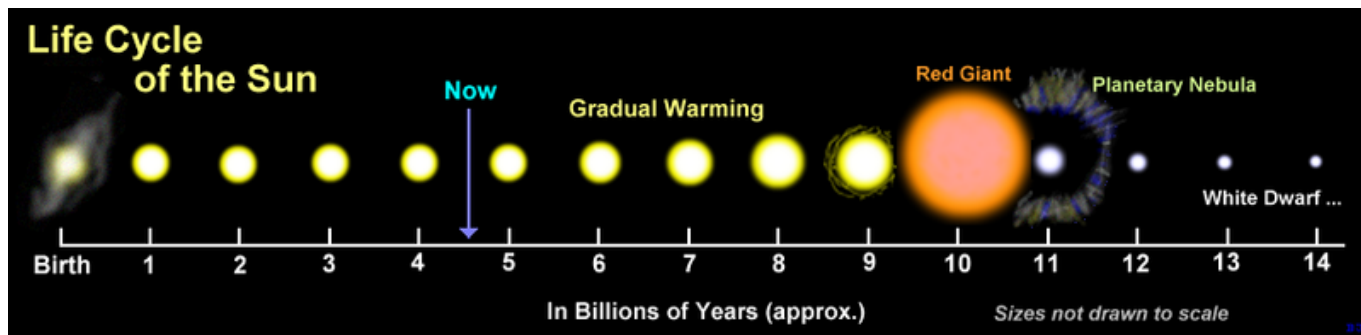
- ☐ Called, the "seat of the soul"
- ☐ Believe to transmit information about light to the body (notably from the Sun)
 - Speculated that it governs bodily functions/activities related to time of day/seasonal
 - Experiments demonstrate its role in aging
- ☐ Serves as the body's time keeper
 - How/Why does your body keep time?

Week 2: Ra (The Solar Cycle)

Role in Creation

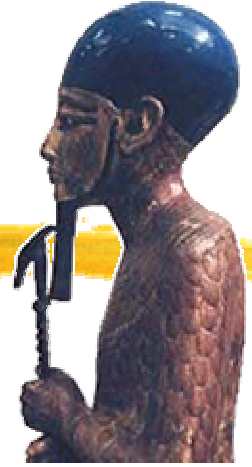
☐ Sun's Creation

- ☐ Theorized that stars are created by explosion of molecular clouds which were the result of a star going supernova and sending out shockwaves (sep tepi?)
- ☐ Molecular cloud began to collapse and condense, and its core grew hotter, eventually causing a self-sustaining nuclear reaction



Week 2: Ra (The Solar Cycle)

Sep Tepi



□ Shabaka Stone

- Creation occurring from 8 primordial entities/beings
- Four female/male pairs; depicted as four frogs and four snakes
 - Nun & Naunet (primordial matter and primordial space)
 - Kuk & Kauket (the illimitable and the boundless)
 - Huh & Hauhet (darkness/eternity)
 - Amon & Amaunet (hidden and concealed ones)
- The eight (the ogdoad) or the ennead (9, plus Nu) bring forth the sun

Week 1: Nut (The Night Sky)

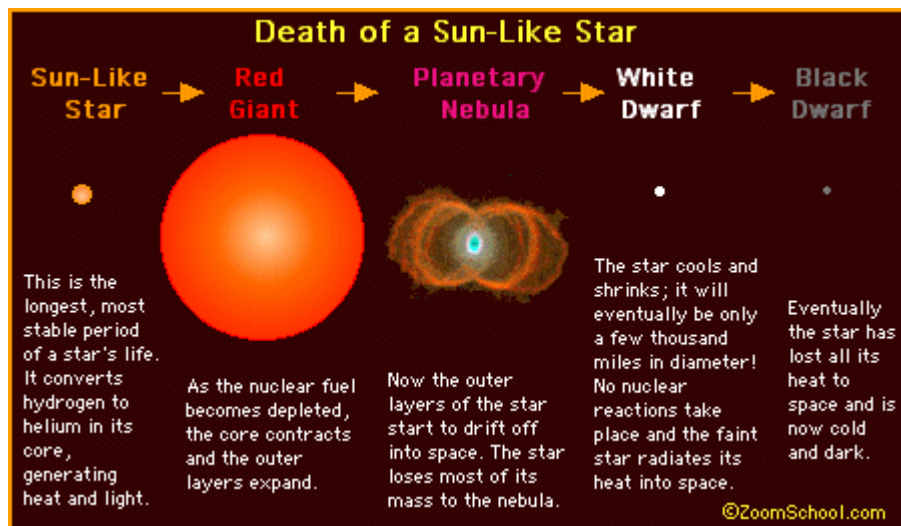
Is this going to end?

❑ A Delicate Balance

- ❑ Our system (life) requires maintaining a very delicate balance to sustain our biosphere
- ❑ Any number of occurrence will terminate our lives here

❑ The Sun's (Ra's) Death

- ❑ The Sun is approximately 4.5 billion years old, and it has used up about half of its nuclear fuel (hydrogen).
- ❑ In about 5 billion years from now, the sun will begin to die, but its effect will be felt *much* (☺) *sooner* (10% in 1 b)
- ❑ 900 million years Earth's surface will be too hot, and in 1 billion years, all water will evaporate



Week 2: Ra (The Solar Cycle)

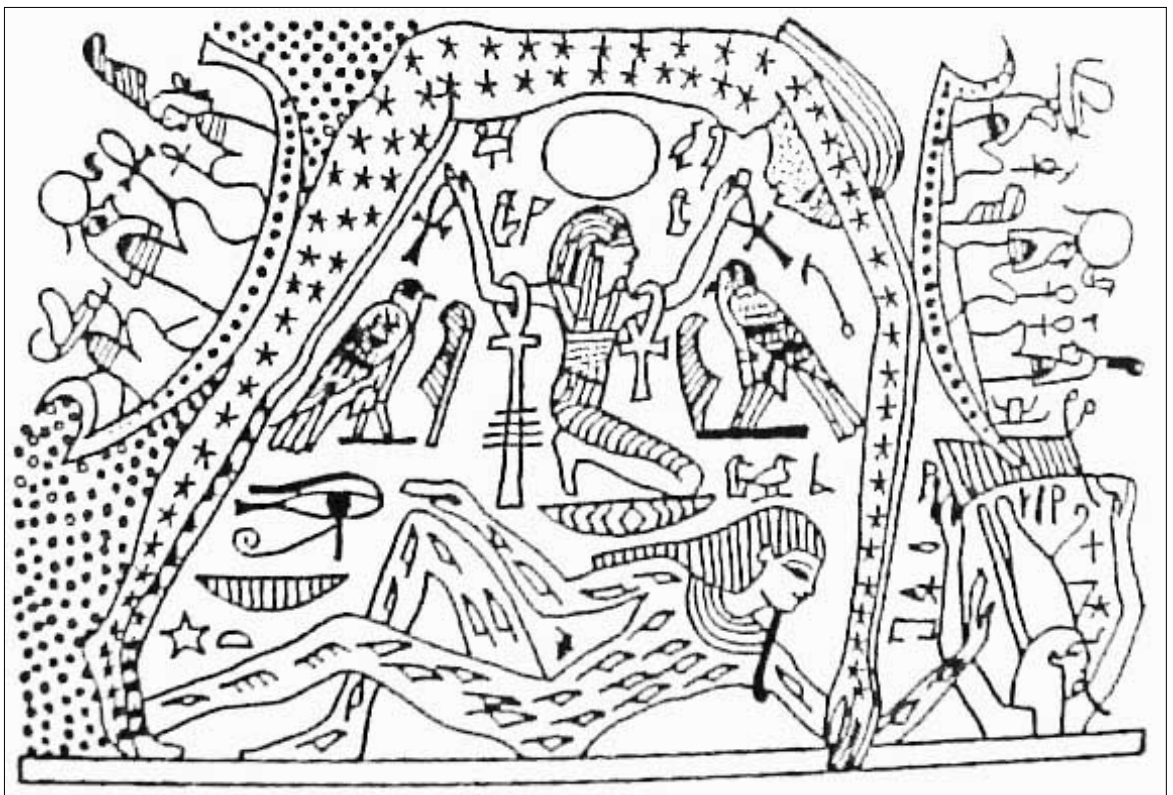
Ra's Journey

☐ Sun's Creation (Cyclical)

- ☐ Ra represents the Sun, and sails across the heavens in a boat called the 'Barque of Millions of Years'
- ☐ At the end of each day Ra "dies" and sails on a nightly voyage through the Underworld, leaving the Moon to light the world above
- ☐ The boat sails through the twelve doors, representing the twelve hours of night-time, and before the next dawn, Ra is reborn – "breaking the night and coming forth into the day"

☐ Boats

- ☐ Begins on the matet boat (growing stronger), and ends on the sektet boat (growing weaker)





Week 2: Ra (The Solar Cycle)

Solstice and Equinox

Event	Date
Spring Equinox	Mar 20 11:44 pm
Summer Solstice	June 21 5:45 am
Fall Equinox	Sep 22 9:18 pm
Winter Solstice	Dec 21 5:47 pm

☐ Solstice

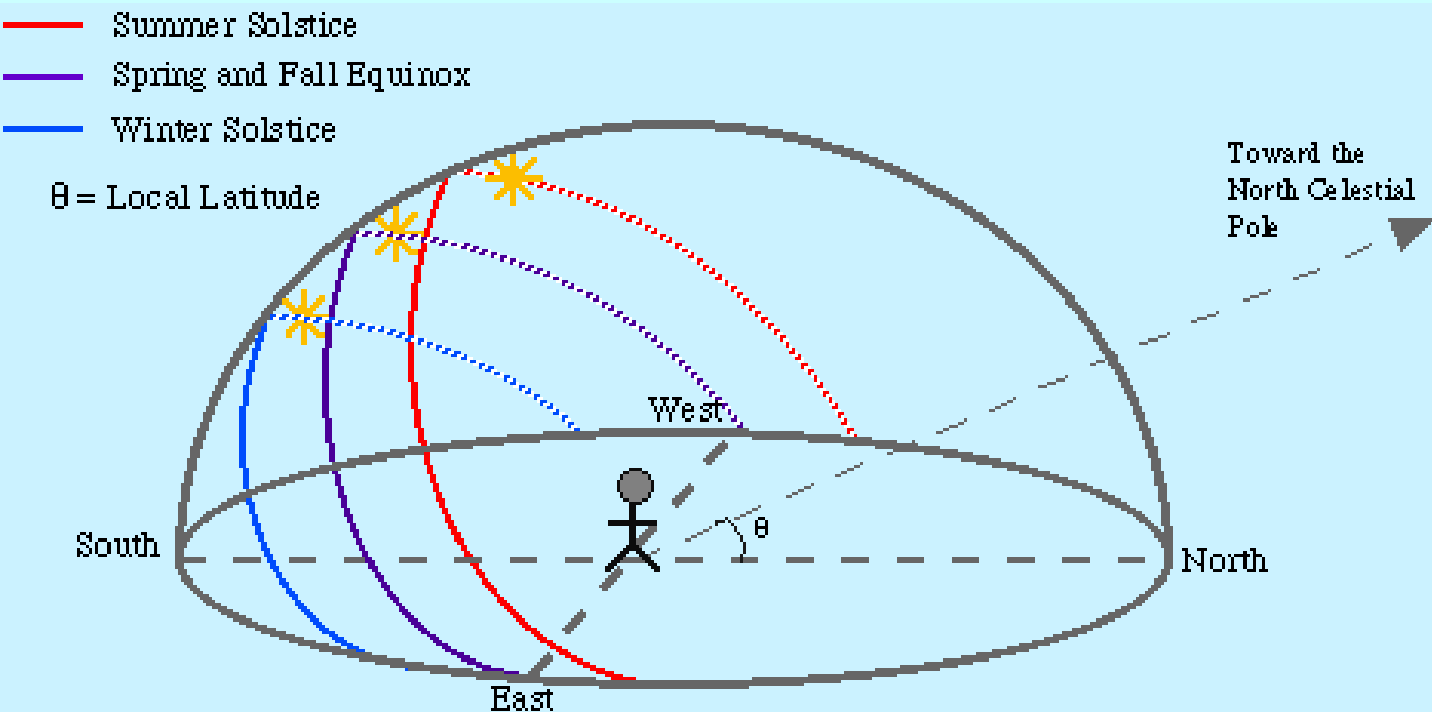
- ☐ Occurs twice each year
- ☐ Summer Solstice; Sun is at its highest path, and the day is the longest

☐ Equinox

- ☐ Twice yearly, when day and night are nearly identical in time

☐ Complete dates for equinox

- ☐ <http://www.treasure-troves.com/astro/>





Week 2: Ra (The Solar Cycle)

Solar Calendar (time)

☐ Seasons

- ☐ Seasons are *not* caused by the relative distance from the Sun, but by the direction of Earth's tilt (23 degrees)
- ☐ During the summer the Earth is tilted towards the Sun, and in Winter, it is away

☐ Calendar

☐ Kemet

- Kemetic calendar initially 360 days, later expanded to 365 $\frac{1}{4}$ days; was established prior to the 1st dynasty
- Retain the notion of 360 degrees completing a circle (or journey)
- 36 decans of 10 days each (equivalent of a week); each decan represented a specific constellation
- Calendar based on the inundation (rising of Sirius) – which introduced the “New Year”
- This rising of Sirius (Kemites called Sothis) signaled the beginning of festivals celebrating fertility and renewal, and the beginning of the inundation – which was the start of the growing season
- Three recognized seasons (Peret – seed, Shenu – harvest, Akhet – inundation)

☐ What are the role of calendars today?

Week 2: Ra (The Solar Cycle)

Original Zodiac



Week 2

Take Home Exercise #2



Zodiac Identification

- Try to identify animals in the original "zodiac"

Web-based telescope

- Download "Google Earth" (it's free)
 - <http://www.google.com/earth/>