Register your clicker

- If you emailed your number already, your ID does not appear, and you do not have to register.
- How to register
  - Your ID will scroll down the screen. (First 3 letters your last name & 1st 2 letters of your first name. John Obama = ObaJo)
  - When you see your ID, press the letter shown beside it.
  - Another letter will then appear. Press that second letter.
  - You have registered.

Models of the sky—3 Sept

- Announcements
  - Register your clicker
  - New policy on in-class exercises
    - You may drop your 3 lowest in-class exercises.
  - Clicker policy
    - If you forget your clicker, you may turn in paper answers at most twice.

Changes in the Sky

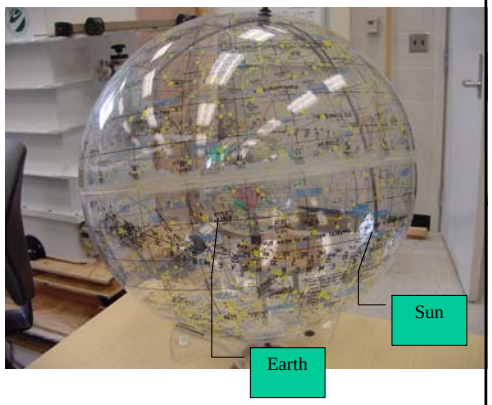
- The sun sets south of west in winter.
- Winter days are short.
- Stars move east to west over a night.
- The constellations change over the months.
- The sun (and moon and stars) rises & sets.
- The sun is higher in the sky in summer than winter.
- Planets move with respect to the stars.
- Comets appear irregularly.

Our model, physical ⇒ mental.

- Greek astronomers modeled the sky.
  - Earth is in the center.
  - Stars are pasted on a celestial sphere.
  - We will figure out what they did about the Sun and moon.
- Our model has Earth, sun, stars on plastic celestial sphere. You may move the sun, turn the earth. Too hard to turn the sphere.

Celestial sphere

- Our model has Earth, sun, stars on plastic celestial sphere. You may move the sun, turn the earth. Too hard to turn the sphere.



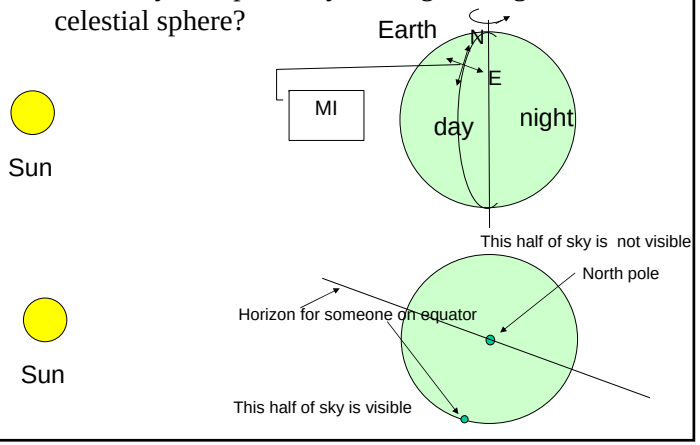
Our model, physical ⇒ mental.

- Our model has Earth, sun, stars on plastic celestial sphere. You may move the sun, turn the earth. Too hard to turn the sphere.

1. With our model, how do you explain the observation that the sun moves east to west over a day?
   A. Move the sun clockwise
   B. Move the sun counter clockwise
   C. Turn the earth clockwise
   D. Turn the earth counter clockwise
2. Over a night, stars move ___. Apply our model to figure out the answer.
   A. west to east
   B. east to west
   C. Movement depends on the season.
   D. Stars are stationary.

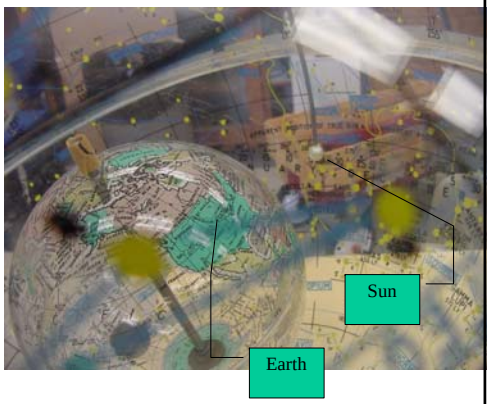
The Celestial Sphere

2. How do you explain day and night using the celestial sphere?



Celestial sphere: sun

- Our model has Earth, sun, stars on plastic celestial sphere. You may move the sun, turn the earth. Too hard to turn the sphere.



Our model, physical ⇒ mental.

3. With our model, how do you explain the observation that different constellations are seen just after sunset at different times of the year?
   A. Sun moves
   B. Stars move
   C. Earth moves.
   D. Earth spins on its axis.

The Celestial Sphere

- The sun "moves" into different constellations of the zodiac during the year.
- For next class, you should be able to do the next question.

4. At midnight tonight, which constellation of the zodiac will be high in the sky?
   A. Leo
   B. Capricorn
   C. Aquarius
   D. Taurus