

Name: _____

Experiment: Model of Expanding Universe & Constellations (E. Science 9-25-4e)

Purpose: To observe a model for the expanding universe and to understand why some constellations are only seen during one season of the year.

Materials: balloon marker string meter stick clothespin Celestial Globe

Methods: **Part A: Expanding Universe**

1. Partially inflate a balloon. Fold the neck and clip it shut with a clothespin so air doesn't escape.
2. Draw five evenly spaced dots on the balloon with a felt - tip marker. Label the dots A through E.
3. Use a ruler to measure the distance, in millimeters, from dot A to each of the other dots. Record this in results.

4. Remove the clothespin and inflate the balloon some more.
5. Repeat step 3, record as trial 2. Repeat steps 4 and 5, record as trial 3.

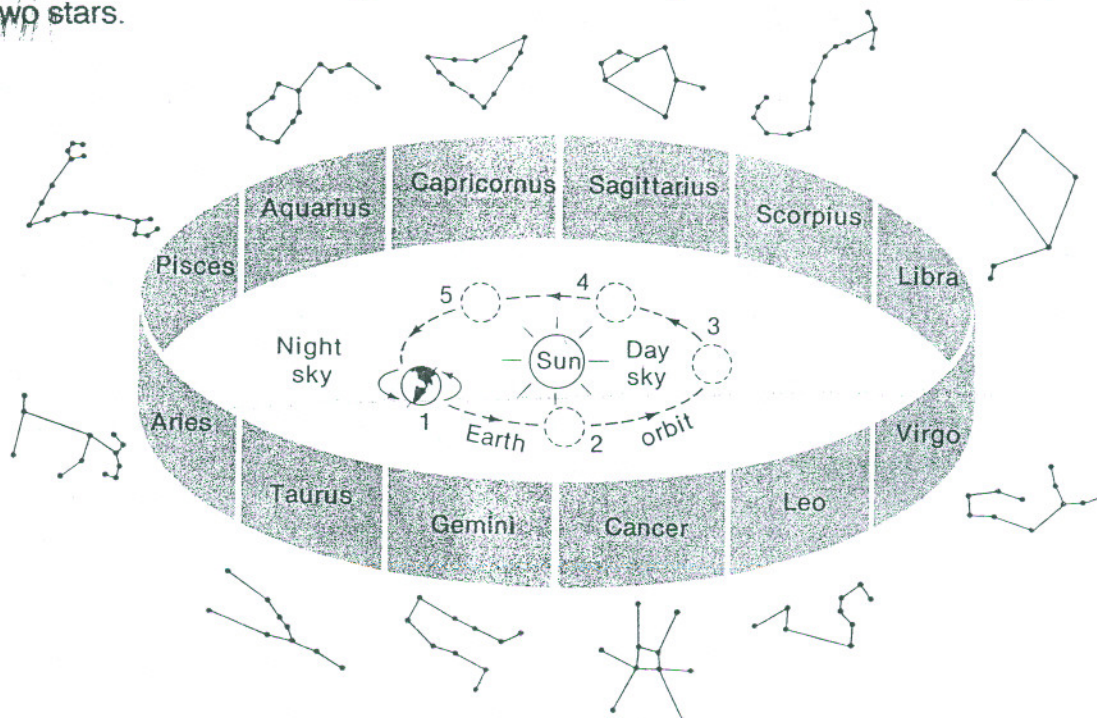
Part B: Constellations

1. The Zodiac is a band of twelve constellations that form a background for the sun as see from the revolving Earth. These stay in line with the equator, up to the Tropic of Cancer & down to the Tropic of Capricorn. Study the diagram below, which shows the Zodiac constellations, the sun, and Earth's orbit. Use the diagram to answer the questions that follow.

2. Notice the five numbered positions along Earth's orbit. For each position, find which Zodiac constellation(s) would be behind the sun (thus not seen) and which one(s) would be near the center of the night sky at midnight.

Part C: Celestial Globe Review

1. Use the declination and right ascension values given in results to identify (name) the two stars.



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Results:

Part A: Expanding Universe	A to B	A to C	A to D	A to E
trial 1				
trial 2				
trial 3				

Part B: Constellations

Position	Constellations behind the sun	Constellations seen in night sky
1		
2		
3		
4		
5		

Part C: Celestial Globe Review

Right Ascension		Declination	Name of Star
14 hrs	13 min	+ 19	
5 hrs	40 min	- 51	

Conclusions:

1. What happened to the distances between the dots as the balloon was filled each consecutively time?
2. If Aquarius is located near the center of the sky at dawn, which constellation will be located near the center of the sky at sunset?
3. If Scorpius is behind the sun at dawn on a certain day, which constellation will be behind the sun at sunset on the same day?
4. Why is the Zodiac constellations seen only during certain seasons while Ursa Major (the big dipper, near Polaris) is seen every season in the Northern hemisphere?

Discussion:

1. If each dot represents a galaxy (part A), describe the motion of the galaxies relative to one another?
2. Is this model (part A) of the universe expanding?
3. Read Deut. 18: 9 - 14. What does the Bible call detestable practices? (List eight)

a.	b.	c.	d.
e.	f.	g.	h.
4. In Isaiah 47 God is rebuking Babylon. In verses 12 and 13 there are several bad practices mentioned. Is astrology (not astronomy) grouped in with these detestable practices?
5. Read Daniel 2:2,10; 4:7, Deut. 4:19, II Kings 23:5 to see the association of astrology with such things as sorcerers, enchanters, and magicians. What should be our attitude to reading horoscopes and getting into astrology?